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PUBLIC HEALTH AND TAXES

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Read before the Public Health Administration Section of the American Public Health Association at the Fifty-third Annual Meeting at Detroit, Michigan, October 22, 1924.

PUBLIC HEALTH and taxes are related subjects. Each is of fundamental importance. One occupies usually a most prominent place in the popular mind; the other receives generally but scant, superficial, and secondary consideration.

POLITICAL ASPECTS

Under democratic government, whatever concerns the interests of the masses of the people is weighed by candidates for elective office, as a rule, not only for its actual value, but also for its political evaluation in a campaign.

Since the United States Government was established, no practicable plan has been suggested, and it is doubtful that one can be formulated to divorce our public health, or any other public business, from politics. Such is not reasonably to be expected in a government of, by, and for the people. Progress of any public business is assured only when, as, and if that business is made "good politics," so that candidates for elective office will support it both before and after election.

Tax reduction is a favorite political slogan. It has a popular appeal. In some instances, the plan proposed would not effect a reduction, but merely a shift of the burden from Peter to Paul—with the Pauls in the majority.

Taxes are collected to pay public debt and provide public service. Reduced taxation may be accomplished, (1) by repudiating public debt; (2) by lessening public service; or (3) by improving business methods of government. Repudiation of public debt is unthinkable and unspeakable to any country that holds its honor high. It is quite possible that some of our public services could be lessened without serious injury to the body politic. But improving business methods of government offers the best hope.

With a reduced total budget, some activities of lesser value might be discontinued or lessened and others of greater value might be established or increased, and the majority of the people be the gainer.

In government business, as in any other business, the exercise of a sense of relative values is all important. A statement frequently quoted on the subject of public health is, "The care of the public health is the first duty of a statesman." This statement was made by a great statesman; but our statesmen generally, it seems,

either have not heard it or they do not believe it. Anyhow, its quotation by candidates before election is rare, and its practical application after election is far from impressive. It has not yet been accepted as good campaign stuff. Read the platforms of the political parties in our present national campaign. Read the speeches of the candidates for high office. Note the prominence given to tax reduction and "economy." Read and reread the planks and utterances touching vaguely, indirectly, and inconsequentially —if at all—upon the subject of our public health. Read them, Oh, Ye Public Health Enthusiasts, read them and weep!

The drafters of these political platforms and our candidates for elective office are chosen because they are supposed to have wisdom. They both represent and interpret public sentiment. They give prominence to those subjects which they (invariably, let us hope) believe important; but in their featuring of subjects, they are expected to give some consideration to rating in popular appeal from a practical campaign standpoint.

To those of us who have studied and know something of our public health business, our hope, until the care of the public health becomes "good politics," must be that our public officials generally will proceed with true statesmanship to support this vitally important business to a greater degree in their post-election performances than in their preëlection promises.

GOVERNMENT BUSINESS

A government is in some respects in the nature of an assessment stock company with the taxpayers as holders of the shares. The directors should assess reasonably, and endeavor to invest the returns to the best advantage of existing and prospective stockholders.

Investment of money to yield 4 per cent when it could be invested with equal safety to yield 8 per cent, or more, is foolish. To withhold one dollar on the grounds of "economy" and lose a hundred dollars, in consequence, is poor business. A commercial corporation could not think of pursuing any such policy. If it did so, the board of directors would be questioned if the stockholders were informed and intelligent. But this is exactly the policy pursued with respect to our public health business.

THE BURDEN OF TAXATION

Are we staggering under our present burden of taxation? In some of our communities we are, but in the vast majority we certainly are not. The people of the United States are now making more, spending more, and living better probably than any nation ever has before. The large increase in our tax rate in the United States since our entry into the World War has been somewhat disconcerting. Our tax bill—local, state and federal—for 1923 was about $8,000,000,000, an amount more than double that for 1916.

In view of our tangible assets and productive power, however, there is no cause for serious alarm. Consider among our assets such items as farm properties valued (in 1920) at over $78,000,000,000, and railways and other public utilities valued at $40,000,000,000. The total net value of our farm products in the average year since 1916 has been over $10,000,000,000. Consider the productive power which has built a city like Chicago within a hundred years, and is progressively increasing.

In this country, the question is not whether we can liquidate our public debts and provide all the public service we need, but how we can do these things most equitably and comfortably. All of us who pay taxes feel immediate relief upon having the rate lowered; but in clamoring for reduced taxation, we should not lose sight of opportunities for highly profitable, proper and needed investment of public funds.

Our government was created and is maintained for the promotion of the general welfare. Is any item in general welfare more important than the lives

and the health of the people? Should not the provision of reasonably adequate service for the care of the public health be one of the primary concerns of government—local, state, and national?

Various philanthropies have contributed importantly to public health progress in the United States; but is it not high time for our governmental agencies to begin to meet their full responsibilities in this field?

Certainly but very few of our communities are unable to provide, through taxation, the funds necessary for adequate public health service without crippling any other important public service. The official health agency has the advantage of police power, and there is no reason why it cannot do the educational part of the work as well as any other agency. Why should an upstanding American community accept gratuity from private sources to support a public service, which it can and should maintain with dignity and pride with revenue from its own sufficient taxable resources? As communities, we should endeavor to maintain our self respect just as we do as individuals.

The magnitude and potential resourcefulness of our government business is indicated by the fact that an adjustment to change the price by one cent on the pound or yard of some one of our principal commodities, makes a difference in profit or loss to the people of an amount of money sufficient to provide adequate public health service throughout the United States. We cannot plead national poverty as an excuse for our lack of public health service. Whatever adjustments are necessary to provide adequate official health service are readily within the power and means of our governmental agencies, and it seems that such adjustments are due.

VALUE AND NEED OF PUBLIC HEALTH SERVICE

The results from well-administered public health service stand, in value to all the people, second to no other obtainable from an equivalent investment of public funds. The high dividend yield in actual dollars and cents on investment for such service has been demonstrated under a wide range of local conditions. This field presents one of the best opportunities for sound and highly profitable public business. Yet only a remarkably small and insufficient fraction of the total receipts from taxation is expended for health service in the United States.

Appropriators of public funds usually deal with intelligent proposals for public health advancement evasively, haltingly, and lamely; and when pressed, suggest that consideration be deferred at least until after the next election. It seems that either the popular attitude toward public health business is wrong, or the political interpretation of it is wrong. The situation challenges the intelligence of democracy.

Because of lack of adequate health service, we have among our people every year scores of thousands of premature deaths, hundreds of thousands of cases of preventable, incapacitating, painful illness, and an economic loss exceeding many times the amount of money necessary to provide such service. Saving at the spigot and losing at the bung is not economy. About two millions of our people are incapacitated by illness all the time. Many of them are wage earners. Figure the daily economic loss. A large proportion of it is preventable.

About 70 per cent of our school children are incapacitated, more or less, by physical defects, most of which are preventable or remediable. If it were necessary, because of national poverty, to resort to such an extreme measure, we might discontinue for two years of the next decade all appropriations for public schools, expend the money so saved in business-like public health service, and actually be ahead with the results of our public school system at the end of the ten-year period.

Over 30 per cent of our people of military age are incapacitated for mili-

tary duty, largely from preventable causes. This is important from the standpoint of the national defense.

About 60 per cent of our men and women between forty and sixty years of age are in need of physical reparation, largely as a result of preventable causes. This is important from the standpoint of full and enjoyable living.

OUR INVESTMENT FOR THE CARE OF THE PUBLIC HEALTH

According to figures collated by Harry H. Moore,[1] the total expended by all official agencies—local, state and national—for public health service in the United States in 1922 was about $60,000,000. This amount is only about six-tenths of one per cent of the total government expenditures in that year. Probably over half of our investment for public health work is expended for inefficient part-time service and unnecessary overhead. We are not investing enough for public health service, and a very considerable proportion of the money so invested is being wasted. The matter is serious. It needs and deserves prompt, vigorous, and intelligent attention from the stockholders in, and the directors of, our government business.

According to other figures cited by Moore, we are now expending in the United States at the rate of about $1,400,000,000 a year for hospital service, physicians, nurses, healers and drugs. Fourteen hundred million for cure and sixty million for prevention! The proportion is not right. Add to the cost of specific curative measures the loss in wage earning and productive work, the human suffering, the mortal anguish, and we reckon the heaviest tax laid upon the economic resources and the hearts of our people. Much of this tax is escapable because a large proportion of the diseases from which we suffer is preventable—and preventable by measures which under business-like public health administration can be carried out at only a fraction of the cost of their neglect.

Publication in a popular way of the total governmental expenditures and the proportion expended for official public health service from year to year in each state and the political subdivisions thereof would be illuminating, and in the course of time might make an important impression upon the minds of the taxpayers. It is hoped that all of our state health departments will undertake to collect such figures and exploit them.

Of the total appropriation of about $3,400,000,000 by Congress for the fiscal year 1924, less than two-tenths of one per cent was available for the distinctly public health activities of the United States Public Health Service.

Where millions of dollars of federal money are made available to assist state and local official agencies in agriculture, stock-raising, road building, vocational education, river and harbor improvements, and prohibition enforcement, only hundreds are available to assist state and local official agencies in public health work. All of these activities are important, but it seems from the evidence at hand that the relative value of investment for coöperative health work might well be considered further by the directors of our Federal Government business.

CONCLUSION

Until the people generally become informed about the results which can be accomplished by well rounded, whole-time, business-like, official public health service and are properly impressed with the importance—both relative and absolute—of such results, we cannot expect their representatives in legislative and executive bodies to devote a due and reasonable proportion of the receipts from taxation to public service for the care of the public health. It behooves us who are interested in public health work, and who have even a glimmer of intelligence of its wonderful possibilities, to do all within our power, persistently and con-

[1] Moore, Harry H., Public Health in the United States, 1923.

sistently, to get and keep the facts and figures before our people.

If the majority of the taxpayers of the United States would take sufficient interest in the greatest business of the world today—their government business—to meet once a month at convenient places to become informed as to what is being done with their investment for the general welfare, we could have a government by the intelligent influence of popular majority, a true democracy, in which the care of the public health would be given its proper place.

REPORT OF COMMITTEE ON REGISTRATION AFFAIRS

Presented to the Vital Statistics Section of the American Public Health Association at the Fifty-third Annual Meeting at Detroit on October 22, 1924.

HEARTIEST congratulations to Florida, which early this month was admitted to the Birth Registration Area. With 87.6 per cent of the population of the United States in the Death Registration Area and 75.5 per cent in the Birth Registration Area, the goal of 100 per cent does not seem so far away. The Bureau of the Census has recently adopted the slogan EVERY STATE IN THE REGISTRATION AREA BEFORE 1930, and it is giving wide publicity to the campaign to make the goal. Letters from the Bureau are now stamped with the following:

VITAL STATISTICS GOAL
EVERY STATE IN THE REGISTRATION AREA BEFORE 1930
YOUR HELP NEEDED

There are two main reasons for fixing 1930 as the year for complete registration areas:

(1) The five-year interval for hard work should be long enough to accomplish the task.

(2) The enumerated population of 1930 will afford a reliable base for rates, which, with all states in the areas, will be the first authentic birth and death rates ever compiled for the entire nation.

During the past year real progress has been made toward better birth registration. The Mothers' Certificate, printed by the Bureau of the Census, is no longer a prospect, but an accomplished fact. Seven states—Pennsylvania, Kentucky, South Carolina, Virginia, Mississippi, Maine and Iowa—already have these blanks and are sending them under the frank to mothers of newborn babes, and Wyoming will soon make the eighth state. The Bureau of the Census furnishes the blanks and franked envelopes, and the states furnish the clerical help to fill out the blanks and address the envelopes. It is interesting to note that one state has been granted $5,000 of the Sheppard-Towner Maternity Welfare money to pay for the clerical work required.

A new scheme for testing birth and death registration has been developed and found satisfactory. The plan is as follows: Through the postmasters and letter carriers, franked postal cards asking for dates of births and deaths and addressed to the Bureau of the Census, are delivered to large numbers of homes. These postal card reports, when returned to the Bureau of the Census, are checked against the official records on file. This plan insures first-hand information from parents to check against the official records.

The importance of keeping up to a high standard of completeness the registration in states already admitted to the areas needs constant emphasis, and to that end nine retests have been made in 1924 and many others have been planned. In emphasizing the need of more complete registration this committee again wishes to urge the need of more reliable data on each certificate.

In many states to-day the certification of the cause of death is often made by laymen, and again the certification of the cause of death is often made by practitioners who are not doctors of medicine. A campaign, therefore, is needed to insure the certification of causes of death by qualified practitioners *only* and your committee earnestly recommends that the Vital Statistics Section consider most carefully ways and means of conducting such a campaign.

WILLIAM H. DAVIS, M.D.,
Chairman.

EVOLUTION AND PREVENTIVE MEDICINE

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Read before the Public Health Administration Section of the American Public Health Association at the Fifty-third Annual Meeting at Detroit, Michigan, October 20, 1924.

SINCE THE TIME of Pasteur, we have been so busy preaching and practicing preventive medicine, and boasting of the remarkable achievements we have attained, that physicians and health officers have possibly neglected to inquire what the end is going to be. We continue to lower our general death rate; we continue to diminish the incidence, as well as the death rate of our contagious diseases. We are building up our power of resistance so that we can overcome the liability to other diseases which are not contagious, and, perhaps above all, we are saving children under five years of age who a few years ago would certainly have been doomed to extinction. We are adding years to the general expectancy of life, as well as the productive and procreative period of life. What will the harvest be?

The biologists and eugenists have taken issue with the public health worker as to the ultimate value and wisdom of some of the work which is being done. The attention of certain clericals has been drawn to this matter, and the "gloomy Dean of Westminster" has thundered against what, he believes, we are bringing upon future generations. The last presidential address before the American Medical Association went into this matter somewhat also.

From a number of different sources, we have evidence that thinking people are questioning the wisdom of some of the things which are being done. Most of us are familiar with the histories of the families like the Jukes and the Kallikaks. Time and again the feebleminded individual has been pointed out as a menace to the mental stability of the future generations of this country. These unfortunates manifest a propensity for begetting numerous offspring, without responsibility for the present or regard for the future.

Dean Inge has pointed out that in each generation the cream of our population is skimmed off, raised to a better social position, and sterilized. There has been a marked decline in the birth rate of the upper classes, and the more highly educated people are, the smaller the family becomes. The same thing is true of skilled artisans. It is the lowest class of our citizens, those who are least fitted for the responsibilities of parenthood and who are least apt to transmit desirable qualities to offspring, who increase most rapidly. Among the scientific men of America the number of children has decreased in one generation from 4.66 to 2.2. The average number of children found in the families of graduates of Harvard and Yale is 1.5; among the graduates of Vassar and Bryn Mawr is 0.8 of one child; Mount Holyoke 0.7, and Smith College 0.6. In addition to this, many of the best strains which the world has known have been lost through religious and other influences. We need only mention that Mendel, the discoverer of the laws of inheritance, was a priest who left no progeny, and that those churches which believe in a celibate clergy and foster the formation of orders in which large numbers of women spend their lives unmated, are constantly taking from the possibility of inheritance the type of mind and character which we need in our future generations.

We have already published an editorial combating some of the views brought

forward by biologists and eugenists.[1] In this editorial, one of the fundamental principles of the biologist was questioned, and it was held, on what seems to be good evidence, that instead of an increase in early adult mortality, due to the supposed fact that many weaklings had been saved during infancy who would naturally be supposed to beget weaklings, the mortality at this age has improved steadily along with the mortality of all other ages. The high infant death rate is considered a sheer waste of human life affecting both the weak and the strong, the bad as well as the good. Doubtless, there is a great deal to be said along this line, and the coming years will demonstrate the truth of one proposition or the other. That there has been an alarming increase in feeble mindedness seems clear and, so far, there have been no effective measures taken in any part of this country to lessen the inheritance of this defect, which must eventually strike at the roots of our civilization.

Another point of view which needs consideration is the natural increase in population. While estimates differ to a certain extent, all agree that the population of the world is increasing at a good rate. In the United States the increase has been tremendous and it is easy to foresee the time when the people of this country will need an outlet, and will be looking for open spaces in which to settle. When one remembers the direful consequences which have followed the necessity of, or the desire for, expansion by other nations, we cannot view the rapid increase of our population with entire equanimity. Within six generations it is probable that the limit of population which our country can support will have been reached. A survey of the situation undertaken in this country, indicates that it can support a population of 200,000,000 on the same standard of life which we now enjoy, but beyond this point our civilization must decline. Many parts of the world, notably those inhabited by the brown races, have already reached their point of saturation. No one can look forward to the prospect of our country and our people descending to such a scale of life as is necessary in many parts of the world, without a determination to do everything in his power to prevent such a catastrophe.

The growth of our population has been phenomenal. In 1800 the population of the world was 850 million, whereas in 1900 it had reached 1,700 million. The age of man is not known, but putting it at 500,000 years, which seems conservative, it is evident that it took one-half million years to produce 850 million people, but within 100 years this number has doubled. The present rate of our increase is between 12 and 20 million people per year; so that one can easily foretell approximately when the earth as a whole will be over-populated, just as it is already in certain areas.

The food supply is already a serious question in many parts of the world, and will rapidly become so for the entire population if the present rate of increase continues, or even if the estimated rate of increase is maintained for our own country. Pearl believes that the rate of increase for America reached its maximum about 1914 and is already on the decline; but even so, the increase in population demands that 40 million acres more of land should be cultivated each year than was cultivated the year before. The world has 13,000 million acres of cultivatable land available, and since two and one-half acres are required to produce food enough for each person, it is evident that the maximum population which can be supported on anything like the present standard of living, is 5,200 million, a number which will be reached at the present rate of increase before many generations have passed.

Some persons have professed to believe that the food difficulty will be overcome by new inventions such as the fixing of atmospheric nitrogen, which is already

[1] "Is Public Health Work a Menace?" *A. J. P. H.*, May, 1924, p. 429.

carried out to a considerable extent for certain purposes. But in view of all that is known at the present time, it seems Utopian to expect the advent of tabloid foods produced by artificial methods of manufacture. While I would be the last to question the inventive power of man, it seems too much to believe that all natural processes will be reversed entirely in the future and food supplied to us from sources which up to the present time have been untapped.

A more serious condition perhaps is the quality of the population which will be produced. When we consider the vast number of paupers, of prisoners and juvenile delinquents, of deaf and dumb, of insane, and low grade feebleminded persons known to exist, and realize that only a comparatively small portion of this class has come under official supervision, we must be convinced that the estimate of one and a half to two million people who need institutional care in our own country at the present time, is not exaggerated. It has further been estimated that 80 per cent of the defects which cause the conditions which have been mentioned are due to inheritance, and yet in no part of this country is there any system that is in the least degree adequate for preventing these people from procreating their kind. It is true that in some states there are laws against the marriage of the feebleminded, and there is some attempt at registering these unfortunates, but at a conservative estimate, not more than 10 per cent of these people are registered even when the system is carried out most efficiently. We need only to consider the history of the Jukes and Kallikak families to realize what this means for the future.

While we may agree entirely with the editorial quoted above, and be convinced that while the early death rate of infants is to a marked degree selective, and that a number of these feebly constituted infants may have the germ of genius in them, our entire experience is against any such views as regards mental defectives. One authority has made a positive statement that: "Mental defect never appears in sound stock as a mere sport." Another says that he has "yet to see a case of mental defect in which one or both parents did not show departure of some kind from the normal." Once again, we may call attention to the comparative study of a family like that of Jonathan Edwards with the Jukes. Nothing could be more convincing of the influence of heredity, at least as regards mental qualities.

It is impossible in a short paper to give an adequate presentation of both sides of this question. Man presents himself to us as an animal from the biological stand-point, and for this man there must be one form of consideration and one treatment. Man also presents himself to us as a social animal, and for this man there must be another set of considerations and another treatment. Biological facts are mostly brutal. Sociological facts are largely humanitarian. The two points of view are not wholly at variance one with the other, but can never be brought into entire harmony with each other. If one asks what the solution of the problem is, I am forced to acknowledge that I cannot answer, and I believe that time only will bring the solution. As long as we live in abundance and the food question does not press us too strongly, the humanitarian side of man will continue to grow, but when our population has reached the point of saturation and the lack of food begins to pinch us, I am inclined to believe that the humanitarian side of our nature will show a falling off and we will be forced to practices which would be condemned, and rightly so, at the present time.

It is hardly too much to say that the food question has been at the bottom of all wars between nations. It is true that some may object that the prizes at stake have been territory, gold, prestige, influence, coal and oil, and while we may admit the truth of this contention as to

the immediate exciting motives, a deeper analysis will show that after all food has been and is the great problem of the universe. Civilization, as we have it at the present time, is constantly tending to the increase of population at a greater rate than would have taken place under natural conditions. In other words, human evolution has been blocked by artificial methods and, as pointed out, the best stocks, which might be able to solve the grave questions of the future, are not being reproduced in anything like a fair proportion compared to the poorer stocks, which have not shown any capacity for leadership, but which have, in fact, given to the better class some of the gravest problems that have confronted us.

As health officers and administrators, we are obliged to follow the dictates of our religious life, and of civilization which is so largely a product of our religions. We laud the philanthropists who looks towards the alleviation of present suffering rather than to the removal of the causes which may lead to suffering for future generations. We are developing somewhat higher altruistic virtues at the expense of efficiency, and an inexorable law will demand redress in the not distant future. It may be that reforms will come about which will delay the gloomy outcome of our present course, such as sterlization of the unfit, more strict laws regarding the mating of the unfit, birth control, etc. I conceive it to be the duty of health officers and physicians to study all of these questions assiduously; but for the present can only recommend that we continue a program of which we cannot entirely approve from a biological stand-point.

AEROBIC SPORE FORMING LACTOSE FERMENTING ORGANISMS AND THEIR SIGNIFICANCE IN WATER ANALYSIS

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AND

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Read before the Laboratory Section of the American Public Health Association at the Fifty-third Annual Meeting at Detroit, Michigan, October 21, 1924.

AEROBIC SPORE forming lactose fermenting bacilli are not infrequently encountered in the examination of water for the presence of Bacterium coli. Since these organisms may be responsible for false presumptive tests, it seemed desirable to obtain more data than is now available with respect to their source and their resistance to bactericidal agents.

Meyer[1] in 1918, described an aerobic spore forming lactose fermenting bacillus which he isolated during the course of routine water analysis. Eight strains were obtained from a city water supply and three from a raw tannery waste. The organism was a large Gram negative, nonmotile bacillus with a centrally located spore. Spore formation took place readily. Pink colonies were produced on Endo medium, and gelatin liquefaction began within 48 hours. Acid and gas were formed in dextrose, levulose, raffinose, maltose, sucrose, lactose, inulin, starch, glycerol and mannitol. Dulcite was not attacked. The methyl red reaction was negative and the Voges-Proskauer test was positive. Indol was not formed and nitrates were not reduced. Acid was formed in milk, with coagula-

tion in 48 hours. Meyer regarded this organism as a possible interferer in determining the colon index. Ewing[2] isolated 14 strains from the Baltimore city water supply. The organism was apparently identical with that described by Meyer. The isolations were made in the spring, following a period of heavy rains. Ewing emphasized the necessity of microscopic examination in the confirmation of Bact. coli tests. Ellms[3] reported sporulating lactose fermenting aerobes in the Milwaukee water supply and also isolated strains from fecal material. He described them as Gram positive and methyl red positive. Perry and Monfort[4] isolated 5 strains, apparently similar to those described by Meyer. Hinman and Levine[5] obtained 14 cultures from Iowa waters. Their strains differed from those of Meyer in being motile and Voges-Proskauer negative. Growth was inhibited by bile and by gentian violet. The organism was non-pathogenic when fed to rabbits. Lisk[6] found similar organisms in milk. Roab[7] has reported the organism in water supplies, and Havens and Dehler[8] found apparently similar bacilli in the intestines of fish.

It has been emphasized, particularly by Hinman,[9] that spore forming, lactose fermenting, aerobic bacilli may constitute a real source of error in water analyses.

We first studied the incidence of these organisms in the Chicago water supply (a chlorinated water), and then examined a variety of substances to obtain information on the sources of water contamination.

The following method was employed for isolation and purification. Samples were collected with the usual precautions and inoculated into lactose broth fermentation tubes. The tubes were then heated in a water bath for 15 to 25 minutes at a temperature of 85° to 90° C. After cooling, the tubes were incubated at 37° C. and gas formation observed after 24, 48 and 72 hours. Endo plates were inoculated from each tube showing gas.

From the Endo plates on which red colonies appeared, transfers were made to lactose broth and to agar slant tubes. If gas was again produced in lactose broth, a Gram stain was made from the 24 hour agar growth and motility observed. A spore stain was made from a 48 hour agar growth. If the organism proved to be a lactose fermenting spore former, two lactose broth tubes were inoculated from a 72 hour agar slant growth, the tubes heated at 85° C. for 25 minutes and incubated. The cultures were again purified by the use of Endo plates, and finally transferred to nutrient agar slants.

Table I shows the sources investigated, the number of test samples and the number of strains of lactose fermenting, spore forming aerobic bacilli isolated. Further work on sources is in progress.

TABLE I

INCIDENCE OF ORGANISM

Source	No. Samples	No. Strains	Per cent
Tap	128	2	1.6
Drinking fountains	50	1	2.0
Raw Lake Water	32	1	3.1
Human Urine	6	0	0.0
Human Stools	36	1	2.5
Street Drainage	44	2	4.5
Sidewalk Drainage	10	2	20.0
Snow	4	0	0.0
Mat Dirt	18	2	11.1
Floor Dirt	8	1	12.5
Street Mud	6	2	33.3
Horse Manure	8	3	37.5
Rabbit Manure	6	0	0.0
Sheep Manure	6	1	16.6
Sidewalk Soil	8	0	0.0
Garden Soil	10	3	30.0
Carrot Washings	8	4	50.0
Oat Washings	8	0	0.0
Swimming Pools	36	0	0.0
Raw Sewage	6	0	0.0
Totals	438	25	5.7

This table shows that 438 samples from a variety of sources yielded 25 strains of the bacillus. The tap water had been chlorinated. The water from the drinking fountains was from the same supply, but had been passed through a small sand filter some time after chlorination. The highest incidence of isolation was from animal manures, garden soil and root vegetable washings. The number of recorded isolations is too small to serve as a basis for definite statements regarding the habitat of these organisms. The results are, however, in line with those of other investigators.

The morphologic and biochemic characteristics of the 25 strains were identical. The organisms were rods 3 x 0.6 microns, grouped singly or in pairs. Spores were abundant in 48 hour growths. The spores were centrally located, were oval in shape and measured 1.5 x 2 microns. Motility was observed in all cultures, but capsules could not be demonstrated. The cells stained evenly with gentian violet and were Gram negative. However, the stain was removed with some difficulty. It is not surprising that conflicting reports have been made on this stain.

On plain agar the colonies were irregular in shape, smooth, and showed no distinct internal structure. On Endo medium pink colonies were obtained. The colonies usually had red centers, but lacked the sheen characteristic of colonies of Bacterium coli.

All strains liquefied gelatin in 7 days. In litmus milk, acid, gas and coagulation were produced. The milk tubes closely simulated those obtained with Cl. welchii. Peptonization had started in all but three instances at the end of 7 days. Indol was not produced. The methyl red test was negative and the Voges-Proskauer reaction positive. Fermentation-reactions were observed on 16 carbohydrates. Acid and gas were produced in 48 hours by all strains, from dextrose, lactose, maltose, saccharose, arabinose, xylose, galactose, mannose, levulose, trehalose, raffinose, dextrin, inulin and salicin. Dulcite and adonite were not attacked.

Since spores form readily on lactose agar slants, this medium was used to obtain spores for tests on their resistance toward heat and chemical disinfectants. The spores survived exposure to 100° C. for 45 minutes. Tests were made on resistance of the spores to the action of chlorine, mercuric chloride, phenol and "Lysol." The results are summarized in Table II.

TABLE II

RESISTANCE OF SPORES TO DISINFECTANTS

Disinfectant	Dilution	Time of Exposure (minutes)	Results
Chlorine	5/1 million	120	—
	5/10,000	120	—
	5/1 000	10	+
	5/1,000	5	—
Mercuric chloride	1/1,500	20	—
	1/1,000	15	—
	1/500	10	+
	1/500	5	—
Phenol	1/50	60	—
	1/20	60	—
"Lysol"	1/50	60	—
	1/20	60	—

+ Indicates that the spores were killed.
— Indicates that the spores survived.

These tests show that the spores are extremely resistant to the action of disinfectants and indicate that they may be expected to survive chlorination of a water supply.

SUMMARY

The lactose fermenting spore forming aerobic bacilli here described are either identical with or closely related to those isolated by Meyer, Ewing, Hinman and Levine and others.

The sources from which they have been isolated, and the high resistance of their spores to chemical disinfectants, indicate that they may appear at times in drinking water supplies even when the supplies have been chlorinated. Their presence has little sanitary significance. However, in routine water examination these organisms may be responsible for positive colon presumptive tests. In order to eliminate spurious results it may be necessary to proceed with the examination of positive lactose broth tubes according to the standard "completed test." The analyst must use his judgment as to this necessity.

Our studies indicate that these organisms will appear not infrequently in surface water supplies after a rainy period.

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SCARLET FEVER

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Read before the Public Health Administration Section of the American Public Health Association at the Fifty-third Annual Meeting at Detroit, Michigan, October 20, 1924.

THE INTELLIGENT prevention treatment of a disease must depend on a definite knowledge of its cause. Attempts to learn the etiology of scarlet fever have long been hampered by failure to obtain the disease experimentally. Symptoms that might represent scarlet fever in animals had been described by various authors; but these symptoms were indefinite and inconstant, and had followed inoculation with different materials and cultures. No organism had produced in animals a condition that could be accepted as experimental scarlet fever.

After three or four years of work on the bacteriology of the throat, blood, urine, and organs of scarlet fever patients, we had been able to verify the results of previous investigators in regard to certain facts: first, that hemolytic streptococci are practically constantly associated with scarlet fever; second, that, while a variety of bacteria may be found in blood cultures, no one organism is present constantly in the blood stream during the acute stage of the disease.

We attempted to produce experimental scarlet fever in guinea pigs, mice, rabbits, dogs, pigeons, and small white pigs. Monkeys were not used, because they had been so thoroughly tried by previous investigators that it seemed unnecessary to repeat their work. The animals were inoculated with blood from early cases, and with pure cultures of many different bacteria obtained from scarlet fever, also with ground-up organs from post mortems, and with mucus freshly obtained from the throat early in the disease.

In this long series of animal inoculations, an occasional rash was obtained, and, less frequently, desquamation. But no one organism produced these symptoms constantly in any species; so the most essential evidence for the determination of the etiology of scarlet fever was still lacking. We decided that animals are comparatively insusceptible to the disease, and that it would be necessary to use human volunteers for the production of experimental scarlet fever.

The successful inoculation of smallpox as a preventive measure led to the hope of a like success from inoculation of scarlet fever, and numerous attempts were made to reproduce the disease experimentally in man. Erasmus Darwin, the grandfather of Charles Darwin, urged the medical profession to undertake such inoculations in the hope of discovering a method of preventing scarlet fever. He suggested that matter might be taken from the ulcers in the throat, or that some of the skin might be scraped off and inoculated.

Attempts were made to produce experimental scarlet fever in man by inoculation with material from erythematous areas; serum from miliary vesicles; skin scales, and blood from scarlet fever patients. Up to January, 1923, there was on record no case of undoubted experimental scarlet fever. The accidental inoculation of human beings had occurred under conditions that threw no light on the etiology of the disease.

Even with human volunteers, we did not expect to obtain experimental scarlet fever readily; for it was known that less than half of the persons exposed to scarlet fever contract the disease.

Healthy young adults who said that they had not had scarlet fever were chosen. In the first series of human inoculations, reported in 1921, volunteers were inoculated with fresh whole blood

and fresh blood serum from acute cases of scarlet fever; also with filtered throat mucus from early cases. The results of these inoculations were negative. Then since the hemolytic streptococcus is the organism most constantly associated with scarlet fever, and the one to which immune bodies are most constantly produced, the next volunteers were inoculated with pure cultures of hemolytic streptococci isolated from scarlet fever. In this series, we obtained an occasional sore throat and fever, but no rash. We thought that failure to obtain the rash might be due to a relative insusceptibility on the part of the volunteers, and decided to do some further inoculation experiments using volunteers of an intelligent type who could give their full personal and family history, and to choose them, so far as possible, from those who had never been exposed to scarlet fever.

In this series, reported in 1923, we obtained a case of typical scarlet fever by inoculation with a pure culture of a hemolytic streptococcus. This streptococcus had been isolated from a lesion on the finger of a nurse who acquired the disease while caring for a convalescent scarlet fever patient. This was the first case of typical scarlet fever produced experimentally with a pure culture of any organism.

It was still necessary to learn whether the experimental scarlet fever had been produced by the hemolytic streptococcus or by a filterable virus associated with it in the culture. A second group of volunteers were inoculated with a culture of the same organism after it had been passed through a Berkefeld "V" filter. These volunteers remained well. After two weeks had elapsed, and they were still well, they were inoculated with the unfiltered culture. Forty-eight hours later, one of them developed scarlet fever. This experiment furnished evidence that the experimental disease was not caused by a filterable virus but was due to the hemolytic streptococcus itself.

There were still some difficulties. Not all of the hemolytic streptococci associated with scarlet fever are of the same cultural type. Some ferment mannite, while others do not ferment mannite. And it was necessary to show that each type is capable of producing the disease. This was done by inoculating other volunteers with the second cultural type, and obtaining another case of experimental scarlet fever.

The requirement of Koch's laws had now been fully met, and we were justified in concluding that scarlet fever is caused by the hemolytic streptococcus.

Since the hemolytic streptococcus is found in the throat, and is seldom present in the blood, it is evident that the rash of scarlet fever is not produced by the direct action of the streptococcus on the skin. It was still important to learn by what means the streptococcus, growing in the throat, caused the rash.

We found that the scarlet fever streptococci produce a toxin. When this toxin is absorbed into the blood, it produces the rash. The toxin is obtained by inoculating plain broth with the strains of streptococci that produced experimental scarlet fever in human beings. A small amount of blood is usually added to the broth at the time of inoculation. After incubation, the broth cultures are passed through porcelain filters to remove the bacteria. The filtrate is cultured for sterility, and kept in a refrigerator.

When suitable amounts of toxin are injected in susceptible persons, it may cause a reaction characterized by general malaise, nausea, vomiting, fever, and a generalized scarlatinal rash. In other words, the sterile toxin alone is capable of producing the characteristic symptoms of scarlet fever, including the rash. These symptoms appear within a few hours after injection of the toxin, and disappear within forty-eight hours.

The toxin is resistant to heat at temperatures ordinarily employed to kill bacteria, but is destroyed by still higher temperatures.

It is neutralized by convalescent scarlet fever serum due to the presence of an antitoxin in the blood of recovered

patients. If persons susceptible to scarlet fever are immunized by injections of small doses of toxin, their blood serum acquires similar antitoxic properties.

These facts indicate that we are dealing with a true soluble toxin specific for scarlet fever.

While minute quantities of the toxin will produce symptoms of scarlet fever in susceptible adults, laboratory animals are comparatively insusceptible to it, so that it is necessary to standardize the toxin on human beings.

The discovery of this toxin offered a scientific basis for:

First, The recognition of scarlet fever streptococci.

Second, The development of a skin test for susceptibility to scarlet fever.

Third, Preventive immunization.

Fourth, The production of an antitoxin.

The two strains of streptococci that caused experimental scarlet fever in man differed culturally, and were not agglutinated by the same immune serum; but they had in common the property of producing the specific toxin of scarlet fever.

Up to the present time, there has been no satisfactory way of identifying scarlet fever streptococci. Since the recognition of the specificity of the agglutination test, and its application to the diagnosis of typhoid fever, many observations have been made on the agglutination of streptococci in relation to scarlet fever. The results of early investigators indicated that most, but not all, of the streptococci associated with scarlet fever are agglutinated by the same immune serum.

But the agglutination test has not furnished a reliable means of identifying scarlet fever streptococci. Certain strains cannot be tested because of spontaneous agglutination. No serum agglutinates specifically streptococci from all cases of scarlet fever. And agglutination of streptococci from other sources is not uncommon.

A study of the toxin production of hemolytic streptococci offers a more hopeful means of identifying those organisms that are capable of causing scarlet fever.

For some years there has been discussion as to whether scarlet fever patients with discharging suppurative lesions should be quarantined until all discharges are stopped, or whether these lesions should be regarded as due to secondary invaders, and the patient released at the end of the usual period of quarantine.

Since hemolytic streptococci are present in the discharges, and scarlet fever is now known to be caused by hemolytic streptococci, the question narrows to a determination of whether or not the streptococci present in the suppurative lesions are the primary organisms or some different and non-specific type of hemolytic streptococcus. This may be decided by testing them for specific toxin production.

In testing these cultures for toxin, it is important to begin with high dilutions of the filtrate, for it has been found that various strains differ considerably in the strength of toxin that they produce, and this precaution avoids unnecessarily strong reactions.

Dilute solutions of scarlet fever toxin are employed in skin tests to determine susceptibility to the disease. The toxin is first carefully standardized on human beings, and diluted so that 0.1 c.c. represents a skin test dose.

An exact dose of 0.1 c.c. of the skin test solution is injected intradermally on the flexor surface of the forearm at the junction of the upper and middle thirds. The reaction is observed in a bright light not earlier than 22 hours, and not later than 24 hours, after the test is made.

An area of reddening 1 cm. or more in diameter constitutes some degree of a positive reaction. An area of reddening less than 1 cm. in diameter is a negative test. A reaction that has appeared but is entirely faded at the end of 24 hours is negative.

We use a ½ c.c. record syringe graduated in tenths of a c.c., with a luer tip and a half-inch, 26 gauge Summit needle. The arm is cleaned with alcohol and then dried. The outside of the syringe is wiped

dry. After the test is made the arm and outside of the syringe are inspected for any drops of fluid to make sure that there has been no leakage about the syringe or needle. The commonest point of leakage is at the junction of the needle with the syringe. This occurs less frequently with the needles that have a soft Britannia metal top than with those made of hard metal.

Any antiseptic solutions used for the syringes or needles may cause slight skin reactions.

The syringes are sterilized by boiling 20 minutes, and the needles are sterilized by boiling or by dry heat. The long boiling is necessary to destroy any traces of toxin left in the syringes or needles from previous use.

No syringe or needle is ever used for a control test solution after it has been used for the toxin until it has been thoroughly cleaned and boiled 20 minutes. After use, the syringes and needles are washed with water, alcohol, and ether and kept dry.

With this technique we have not found control tests necessary except after active immunization with the toxin when a true pseudo reaction is occasionally found. The best control solution is the sterile medium, filtered and used in the same dilution that has been found correct for the corresponding batch of toxin.

Pseudo reactions were described by Zingher, who noted that they are more likely to occur after immunization. They are frequent enough to make the use of a control test after immunization advisable.

In our first series of skin tests reported in January, 1924, we found positive, or strongly positive, reactions in 41.6 per cent of the persons who gave no history of scarlet fever, and negative, or only slightly positive reactions in all of the convalescent scarlet fever patients tested.

Branch and Edwards reported 40 per cent positive, or strongly positive, reactions in persons with no history of scarlet fever and negative reactions in all convalescent scarlet fever patients tested.

Zingher found a similar relation between immunity to scarlet fever and skin tests with scarlet fever toxin.

Zingher showed that there is a parallelism between immunity to scarlet fever and immunity to diphtheria in various age and social groups. He demonstrated a placental transmission of scarlet fever antitoxin from mother to child. According to his results, most infants show negative reactions during the first months of life, and the skin test becomes positive toward the end of the first year. In this connection it is interesting to note that nearly one hundred years ago, Most, in speaking of the possibility of inoculating against scarlet fever, recommended that such inoculations should not be attempted in children under two years of age because of the insusceptibility of the young child.

Since Jenner's success with smallpox vaccination, many attempts have been made to inoculate human beings with scarlet fever in the hope of preventing more severe attacks.

The most extensive use of vaccine for the prevention of scarlet fever was made in Russia. This procedure was introduced by Gabritschewsky in 1905. The vaccine was prepared from broth cultures of hemolytic streptococci isolated from scarlet fever. These cultures were heated at 60° and preserved with 0.5 per cent carbolic acid. Three subcutaneous injections of the vaccine were given. Altogether, this method was employed in about 50,000 cases. Mild attacks of scarlet fever, with rashes, either local or general, were described following administration of the vaccine.

In the light of our present knowledge of scarlet fever toxin, it seems probable that this toxin was present in the broth cultures used in the preparation of Gabritschewsky's vaccine; so that, while they believed their results to be due to a streptococcus vaccine, the rashes described and any immunity obtained may have been due to toxin, unwittingly injected along with the killed streptococci.

After demonstration of the specific toxin of scarlet fever and the development of the skin test for susceptibility, we began immunization of susceptible persons by subcutaneous injections of small doses of toxin. We found that by beginning with a small dose, it is possible to avoid severe reactions.

In any large series of skin tests, there will be found a group of clearly negative reactions, another group of definitely positive reactions, and a third group of slightly positive reactions.

Persons who show negative skin tests do not require immunization. We are immunizing all those who show any degree of positive reaction. The immunization consists of three doses of toxin given at five-day intervals.

Following immunization, a skin test should be made to determine the degree of immunity that has been obtained.

A type of skin reaction frequently found after immunization is one that appears quickly, but fades within twenty-four hours, and is, therefore, negative.

If the skin test is still positive after three immunizing doses, the third dose should be repeated, or a larger dose may be given.

Experience has shown that immunization must be carried to the point of a negative skin test.

Prevention of scarlet fever, after exposure, is more complicated. In case of definite exposure, skin tests are made as soon as possible, and at the same time, a culture of the throat is made on blood agar plates. If the skin test is negative, nothing more is done.

In those with positive skin tests, the next step depends on the throat culture. If the plates show no hemolytic streptococci, and further exposure can be avoided, active immunization is carried out with three doses of toxin.

If the throat culture shows hemolytic streptococci, passive immunization is accomplished by injection of convalescent scarlet fever serum, or concentrated scarlet fever antitoxin. We use convalescent serum when it is available to avoid sensitization to horse serum.

The passive immunity is transient. It does not protect for more than a few weeks.

These preventive measures were carried out in a series of 200 persons exposed to scarlet fever. One hundred of this series were nurses in contagious disease hospitals who were tested and immunized before exposure; 100 were children who were not seen until after exposure. Ten of the children with positive skin tests showed hemolytic streptococci in their throat cultures. They received convalescent serum. Five already had sore throat and fever at the time they received the serum. None of these 200 persons exposed to scarlet fever developed the disease.

Controls were afforded by 42 nurses and interns on whom skin tests were not made, and by 2 nurses who were exposed to scarlet fever before their immunization was completed. These 2 nurses and 7 others of this control series contracted scarlet fever.

The toxic element of scarlet fever has long been recognized by clinicians. Variation in degree of toxaemia has served as a basis for the differentiation of clinical types. Thus, Osler, in describing the fulminant toxic type, wrote:

"With all the characteristics of an acute intoxication, the patient is overwhelmed by the intensity of the poison, and may die within twenty-four or thirty-six hours."

And Holt said of the malignant type: "Death occurs apparently from scarlatinal toxaemia."

When the use of convalescent serum in the treatment of scarlet fever became general, it was learned that it is the severe, toxic type of scarlet fever in which it is the most useful; and that the symptoms most benefited are those commonly attributed to the toxaemia.

In 1895, Marmorek obtained an antistreptococcic serum by immunizing horses with living streptococci. This serum was

not produced with a view to its use in scarlet fever alone, but with the idea that it would be useful in all streptococcus infections.

Since then many antistreptococcic serums have been prepared for use in scarlet fever. Of these serums, the one most widely used was that described by Moser in 1902. Moser immunized horses with living cultures of hemolytic streptococci cultivated from the heart's blood of fatal cases of scarlet fever. He reported a series of cases treated with his serum, and two control series; one treated with Marmorek's serum and one with normal horse serum. There can be little doubt that Moser's serum exerted a favorable influence on the rash, temperature, and general condition in many cases.

The antistreptococcic serum described by Dochez and Sherman in 1924 was also obtained by immunizing horses with living streptococci isolated from scarlet fever. The method of immunization differed in detail from that employed by Moser in that, while Moser injected serum broth cultures of the streptococci, Dochez and Sherman injected agar cultures.

It has been necessary to employ all of these antistreptococcic serums in large doses—up to 100 and even 200 c.c. This results in frequent and severe serum reactions. It was on account of these serum reactions, to which some deaths had been attributed, that the use of Moser's serum was gradually abandoned.

If horses are immunized by subcutaneous injections of gradually increasing doses of sterile scarlet fever toxin, they produce an antitoxin capable of neutralizing the toxin.

This serum may be concentrated by the same method employed for the concentration of other antitoxic serums. The resulting product is of high antitoxin content, and the serum reactions that it causes are so few and mild that they do not interfere with its routine use in the treatment of scarlet fever, or with its prophylactic use when convalescent scarlet fever serum is not available.

Scarlet fever throughout the country has been comparatively mild for several years. The present low death rate from this disease shows that not many lives will be actually saved by any serum.

In 430 cases of scarlet fever admitted to the Durand Hospital in one and a half years, there were only 5 deaths. All of these fatal cases were admitted comparatively late in the disease, and were septic. Three had broncho-pneumonia, empyema, and nephritis; one had suppurating cervical lymph glands and nephritis and the other was a case of puerperal sepsis with sloughed perineal stitches, foul lochia, and persistent vomiting. It is not probable that any serum could have saved the lives of these patients after the complications had developed.

Blake, Trask and Lynch reported results with the antistreptococcic serum prepared by Dochez and Sherman in a series of 13 cases of scarlet fever occurring in New Haven last winter. In their series of 13 cases, the one death results in a mortality of 7.6 per cent. If the two cases, which they describe as having an almost hopeless prognosis without the serum, had died, there would have been a mortality of 23 per cent in their series.

This would indicate an exceptionally virulent type of scarlet fever in New Haven while scarlet fever in the rest of the country was comparatively mild. On investigation, we found nothing to indicate that this was the case.

They offered no control series, but from the records of the New Haven Health Department, we learned that out of 197 cases of scarlet fever reported in that city between January 1 and April 1, 1924, there were only two deaths, resulting in a mortality of but 1 per cent, and one of these deaths occurred in Blake's series of 13 cases. These figures illustrate the necessity for a large series of cases and adequate controls in attempting to determine the therapeutic value of any serum.

We have been employing the concentrated scarlet fever antitoxin in some of

the more severe cases of scarlet fever admitted to the Durand Hospital. Our series is not yet large enough to justify definite conclusions as to its value.

We had found that, if the antitoxin is given early in the disease, a definite fading of the rash is apparent within 24 hours, and there is an improvement in the toxic symptoms. So the antitoxin may be said to remove the toxic element of the disease, including the rash. The subsequent course depends on the local infection in the nose and throat.

The sinuses, glands and ears are frequently involved early in the disease. After enough antitoxin has been given to relieve the patient of the necessity for combating the toxaemia, these local complications should receive careful attention.

Because complications may occur so early in scarlet fever, and the damage done by the disease is to be estimated not so much in the number of deaths as in the after effects, the importance of preventive immunization is apparent.

Idealism in Public Health.—The Society possesses enormous possibilities of power and influence for the public good. This power and influence can, however, be acquired only by careful organization and the inculcation of high ideals and loyalty and self-sacrifice among the members.

The real incentive for most of our work is pure idealism, the medical officer of health being indeed his brother's keeper, and the protector and savior of the "under dog."

Training.—Public health having come into its own to some extent and being recognized generally as a subject of outstanding importance, it is not unreasonable to suggest that the subject of preventive medicine should occupy an adequate proportion of the time of the medical student in training. The General Medical Council said, a few years ago, "That throughout the whole period of study the attention of the student should be directed by his teachers to the importance of the preventive aspect of medicine." One wonders what effect this pious expression of opinion, without the slightest backing in the way of regulations, and without any suggestion on the part of the Medical Council as to how this desirable condition should be brought about, has influenced the courses of instruction in the medical schools. After many years' experience as a member of the teaching staff of the medical schools, and as an examiner, I venture to say that that expression of opinion has not up to the present had appreciable effect, and that it is not likely to have much so long as the medical schools continue to be, as they probably always will be, governed almost entirely by clinicians.

At the present time the average medical student leaves his school a fully qualified medical practitioner without any real knowledge of, and without any inclination towards, the study of prevention. This is entirely wrong, and must be altered if we are to make such advances in public health as we all desire to see brought about.

Everyone admits that it is more important to prevent disease than to cure it, and it is quite time that this important specialty played a more prominent part in influencing professional training in general, and for its own branch in particular.—Robert A. Lyster, M.D., Ch.B., S.Sc., D.P.H., Presidential Address at the Annual Meeting of the Society of Medical Officers of Health, London, England, October 17, 1924.

THE RIPE OLIVE SURVEY OF 1924

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Read before the Food and Drugs Section of the American Public Health Association at the Fifty-third Annual Meeting at Detroit, Michigan, October 20, 1924.

THREE OUTBREAKS of botulism due to canned ripe olives have occurred during 1924. These unfortunate incidents revived the suspicion of this product aroused by the series of outbreaks in 1919 and 1920, which had been largely allayed by the earnest efforts made jointly by the state and the packing companies involved. A re-survey of the ripe olive situation by the Bureau of Chemistry was, therefore, necessary.

In our previous survey,[1] we reported the examination of 2,161 containers. Bacterial cultures were made from the first 500 containers consecutively opened, and, subsequently, the findings in cultures from 118 more containers were added to the report. In this study it was found that a container of ripe olives, free from swell and containing olives of good odor, free from off or offensive odors, and free from other abnormal appearance, was consistently free from determinable evidence of bacterial activity. Although bacteriological examination of such a container might show the survival of some spore-forming organisms, extensive feeding experiments showed no toxicity in such olives. On this basis millions of cans of olives have been safely consumed. Such requirements for good olives would exclude from use all doubtful or questionable products; this does not involve any pretension to believe that all products so excluded are poisonous.

The first of the three outbreaks of 1924 was traced to a coded lot, which was promptly withdrawn from sale by the packer. Samples, totalling 84 cans, from this lot, were forwarded to the Microbiological Laboratory for examination. The olives in these containers were somewhat irregular in size, unevenly colored, many of them very black. Most of them were firm or rather hard, but many with soft and apparently decayed spots were found. The samples received included a small number of cans which were swells or springers, but the remainder were flat and apparently normal.

Each can was opened with bacteriological precautions and a subsample taken. The contents were examined by two of us, one of whom had seen nearly every one of the two thousand or more cans studied during the previous survey. The judgment of the examiners was recorded, and the bacteriological results were added after the cultures had been incubated and studied. Samples from cans showing signs of bacterial activity were fed to guinea pigs. Check samples showing no trace of activity were also fed. No toxic sample was found among the 84 cans received. The examiner's record of appearance and odor based upon the experience of the previous survey coincided with the subsequent bacteriological examination. No olives whose odor even remotely suggested the toxic olives of 1919–20 were obtained from the samples submitted.

Many cans in the lot were not sterile. In cans free from signs of decomposition viable aerobic organisms were occasionally found, but no evidence of bacterial activity. All of these results agree in essentials with the findings of the previous survey.

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After two further outbreaks had occurred in July, the Bureau of Chemistry instructed its field force to examine all stocks of canned ripe olives wherever found, regardless of the packers involved, and to send to the Microbiological Laboratory for study all questionable or spoiled materials encountered. As a result of the survey thus initiated through the coöperative work of state and city officials and the Bureau's own forces, the laboratory received during July, August and September more than 800 inspector's samples, totalling more than 2,900 containers. These came from 30 states, the District of Columbia and Porto Rico, and included collections from more than 120 cities. Many of these samples came from dealers' shelves where they were actually exposed for sale.

Among the lots, samples bore the labels of 20 packers (actually 19 by apparent change of name in one case). In addition there were many of the private brands of wholesale grocers, which do not identify the actual packer.

Although, in consequence of the orders under which they were collected, these samples cannot be claimed to be representative of the actual stocks of ripe olives on hand, a study of so large a number of samples offers an opportunity for some significant observations.

In examining this mass of material, at least two examiners handled every container. Usually three or more persons examined each can. In addition to the authors, Dr. C. A. Browne, Dr. W. W. Skinner and Dr. F. C. Blanck were present a portion of the time and saw typical lots of these olives.

In making the examination, the condition of the container was first recorded. Typical cans representing the various conditions observed were set aside for rigorous bacteriological examination. The bulk of the containers were given a routine examination, based upon our general experience in dealing with large numbers of samples of this and other products. This procedure was as follows:

The top of the can was removed and the contents observed and smelled at once, never by less than two examiners, and in cases of doubt by three or more. Bacteriological subsamples were taken from the contents of those containers whose odor or appearance after opening furnished ground for suspicion. Enough bacteriological samples were taken from products apparently sound to maintain a constant check upon the judgment of the examiners. Samples suggestive of marked bacterial activity were fed to guinea pigs together with samples from representative cans in normal and questionable groups.

After examination of the olives, the container was emptied, and its interior, if metal, was examined. The condition of the metal was noted as bright, etched or corroded in varying degree.

No detailed tabulation of the results will be presented, since figures and percentages under the circumstances described have little significance except as an indication of the abundance of some quality of defect. The significant observations will be given in a series of paragraphs.

1. No olives capable of causing botulism were found in these survey samples. There were many swelled cans, however, and some of them had odors suggestive of B. botulinus infected olives as previously handled by us. In addition to culture, samples from all such cans were fed to guinea pigs, but no botulism resulted. Careful study of the bacterial cultures obtained and feeding experiments with the organisms found, failed to disclose a single can infected with B. botulinus. The possibility that some infected cans escaped is not excluded, but is regarded as remote.

2. Questionable or markedly spoiled olives were found in containers of every brand. Swells, springers, cans which were merely "off" in odor, and cans which had offensive, even putrid odors were all found. Many cans had developed odors designated "sour," others odors which were metallic. A peculiar odor definitely

foreign to olives was frequent in the brine and olives from lacquered cans. Cans showing definite bacterial activity were found well distributed among all the different brands.

3. The outstanding defect in most of the questionable products was apparently the corrosion of the containers. So serious and so frequent were these observations that a typical series of cans was selected by Dr. F. C. Blanck for analysis by Mr. J. I. Palmore, whose results, expressed in milligrams of tin per kilogram of olive meat, are given in Table I. Bacterial activity sometimes accompanied and complicated the observations in such cans. Most commonly the markedly corroded samples were swells. Some of the harder swells contained hydrogen under sufficient pressure to produce a flash or spurt of flame if ignited as the can was punctured.

The collection reports showed that some of these samples were known to have been upon the retailers' shelves as long as seven years. By courtesy of the manufacturers, the age of many more of these samples has been ascertained. Anaerobic bacteria have been found viable in olives canned by at least seven of these packers during the season of 1923–1924. Swells and springers were found in many lots packed during the season of 1923–1924, with and without evidence of the presence of viable bacteria. Other samples were found three, five, six and even ten years old.

In comparing the amount of tin found in the olive meats with the condition observable in the metal of the container, corrosion becomes marked in samples in which the amount of tin in solution has reached about 300 milligrams per kilogram. Discoloration and etching are frequently evident where the figures are considerably smaller. In a can of fruit salad, examined during the same period, the offensively metallic taste in the fruit itself led to the examination of the empty can and detection of its corroded condition, followed by analysis which showed 421 milligrams of tin per kilo of fruit.

TABLE I
ACIDITY, SALT CONTENT, AND TIN CONTENT OF TYPICAL SAMPLES

No.	pH value	Liquor: Salt (Grams per 100 c.c.)	Mgs. of tin per Kg. of olive meat (pitted olives)
1 (glass, metal top)	6.2	2.2	20.5
2	5.4	1.8	44.9
3	6.2	2.9	56.7
4	6.0	2.4	85.1
5	6.2	2.8	88.3
6	5.6	3.2	111.9
7	5.8	3.6	132.4
8	5.0	3.1	179.7
9	6.2	3.8	321.5
10	6.0	3.0	430.3
11	6.2	2.8	431.9
12	5.8	2.3	494.9
13	5.4	3.1	712.4
14	5.4	3.0	844.9
15	6.2	3.9	975.7
16	5.4	3.6	1054.5
17	5.0	3.2	1086.0

In many of these swollen cans, puncture and relief of pressure was followed by escape of gas from the interior of the olives themselves in bubbles and chains of bubbles readily visible. Sometimes gas-blisters collected under the skin of the olive, or tension was relieved by spurts of gas and liquid through punctures or breaks in the surface. Markedly abnormal odors were commonly noticed from olives in such condition, although in the early stages of "hydrogen swelling" such changes in odor were not detected.

Among these lots every grade of gas tension was encountered, as well as "flat" containers in which leakage was more or less evident, but which had all the criteria of deterioration except the swell of the container. Gas analysis in three of the swelled cans showed roughly two parts of hydrogen to one part of carbon dioxide. Bacterial cultures showed living organisms in the same cans.

None of the olives from markedly abnormal containers were tasted. After the experiences of several years of investigation of botulism, no one is justified in knowingly consuming food from containers showing abnormal condition before or after opening, even though the danger may be small. In abnormal lots of canned food chemical and bacterial decomposi-

tions are frequently found in the same container and their results are not separable by the senses. If abnormality is perceptible, therefore, the material should be regarded as unfit for use.

From the standpoint of danger of botulism, these results were reassuring. In this large number of spoiled and questionable containers, no dangerous olives were detected; hence, even among spoiled olives, toxic material is comparatively rare. Nevertheless, proper application of the criteria of soundness would have removed the large majority of these cans from exposure for sale. No bacterial activity was detected in materials which were free from well-known marks of incipient decomposition. Olives from samples in first-class condition were eaten freely by the examiners.

The possible danger from products in which the organism of botulism has begun to develop, but has not gone far enough to produce either swell or odor in the container, must be considered. Meyer, in a recent paper read before a meeting of those interested in packing ripe olives in California (distributed in mimeographed form), correctly regards the danger from "flat" cans as real, and cites the failure to report observations on the part of those responsible for serving olives in the Coalinga outbreak (March, 1924) as evidence that the condition of the container was not determinable.

In the Wyoming outbreak of July, 1924, there is no record of any observation of the condition of the can involved or of the olives themselves by those responsible for serving them as food. We have examined three olives from that can, however, and the odor was strongly offensive and fairly characteristic of commercial and experimental samples connected with proved contaminations with the organism of botulism. Such olives are rarely encountered in a flat can, but are easily recognizable by odor as spoiled. Cans and bottles frequently leak about the seams sufficiently to permit the escape of gas without showing their leaky condition, except under careful scrutiny. Examination of the container is not sufficient. No one acquainted with the characteristic odor of sound canned ripe olives could possibly mistake the condition of this Wyoming sample. The olives received by us from the can involved in the Coalinga outbreak of the spring of 1924, were evidently fermented, but were so apparently contaminated with other substances that no opinion could be safely based upon our examination.

The examination of one of our experimental packs furnishes some additional evidence upon this phase of the subject. On November 19, 1919, Miss Edmondson and the senior author opened a lot of cans of sevillano and ascallano olives; selected only olives in first-class condition; filled them into No. 2 sanitary cans, in hot enough condition to obtain a fair exhaust; and added to part of them spores of B. botulinus belonging to the Boise strain; to another part spores of the strain involved in the Canton, Ohio, outbreak, and left checks uninoculated.

These cans were processed in a water-bath for varying, but short periods, at no time above the boiling point of water. All of the cans were placed in the incubator, in which our B. botulinus cultures were kept at 37° C., and examined at intervals of about one month until July, 1921. No swell occurred during that period in any can. No change of odor was detectable. No sample killed the guinea pig used. Nevertheless, B. botulinus was regularly recovered by Miss Edmondson in culture.

In July, 1921, the remaining cans were taken from the incubator, packed in a box and left untouched until June, 1924. They were then reëxamined, and four hard swells and one springer were found. These five cans and seven flat cans have been opened and examined, and the results are given in Table 2. The individual olives were little changed in texture or appearance. The cans were not noticeably corroded. Liquor from the four "hard swells" (Nos. 1, 5, 9, 10)

when fed, killed the guinea pigs in less than 24 hours. Cultures showed viable B. botulinus. The contents of the springer (No. 11) were less toxic, since 5 c.c. of liquor from the can produced no effect on the two animals fed. When olives were ground, and approximately the meat of one whole olive was fed to each animal, one of two guinea pigs succumbed. All five (1, 5, 9, 10, 11) had positive odor, such as were observed previously in botulinus-infected food.

One flat can (No. 8) contained olives with odor of the same character, but not so intense as that of the swelled cans. Liquor from this can also failed to kill guinea pigs, but emulsified olive meats, therefrom killed one of two test animals used. Cultures from this can developed slowly, but eventually two out of three showed B. botulinus present and proved toxic when fed.

Cans 2, 3, and 7 were sterile. One cubic centimeter of a five-day culture from can No. 6, which was flat and the olives normal in odor, killed the guinea pig in 18 hours, although the olives in the can showed no toxic effects when fed. Cultures from cans No. 4 and No. 12 showed other organisms present, but no B. botulinus.

These results confirm Dr. Meyer's statement that flat cans may contain dangerous olives. The odor of the toxic olives, however, was very distinct and definitely abnormal to canned ripe olives. Olives from flat cans and with characteristic ripe olive odor produced no ill effects, even though the B. botulinus could be recovered by culture. There was no evidence of any bacterial activity in those flat cans whose contents were normal in odor. It is distinctly helpful in judging the condition of the olives to have accessory information regarding freedom from marked cloudiness and sediment.

TABLE 2
EXAMINATION OF OLIVES INOCULATED WITH B. BOTULINUS NOVEMBER 19, 1919

Can No.	Condition of Can	Odor of Contents	Feeding Experiments on Guinea Pigs		Cultural test for anaerobic organisms	Feeding Tests with anaerobic cultures 5 days—37° C.
			5 c.c. Liquor by Mouth	5 c.c. Extract of Meat by Mouth[a]		
1	Hard swell	Like culture of B. botulinus. Olives mushy	2 killed in 24 hours.		+ +	
2	Flat	Normal	Non-toxic		—	
3	Flat	Normal	Non-toxic		—	
4	Flat	Normal	Non-toxic		+ +	
5	Hard swell	Like B. botulinus culture. Olives mushy	2 killed in 24 hours		+ +	
6	Flat	Normal	Non-toxic		+ +	Killed in 18 hours
7	Flat	Normal	Non-toxic		—	
8	Flat	Bad—like B. botulinus culture	Non-toxic	1 out of 2 killed in 72 hours	+ +	Killed in 18 hours
9	Hard swell	Like B. botulinus culture	2 killed in 24 hours		+ +	
10	Hard swell	Like B. botulinus culture	2 killed in 24 hours		+ +	
11	Springer	Like B. botulinus culture	Non-toxic	1 out of 2 killed in 48 hours	+ +	Killed in 18 hours
12	Flat	Normal	Non-toxic		+	Non-toxic

[a] Extract prepared by macerating four olives in sterile mortar with 20 c.c. sterile physiological salt solution.
— No growth.
+ Growth.
+ + Heavy growth.

In dealing with the inspection problem, toxicity in such a flat can as No. 8 in Table 2 is clear evidence of the necessity of carrying instruction as to proper criteria of soundness in canned food to every person opening such food for use. Proper inspection in the lines of distribution would have removed all the other spoiled cans, but offers no means of detecting such cans as No. 8.

In the whole survey, spoiled or questionable products were distributed throughout all brands and in all the regions surveyed. The presence of such material on the retail dealers' shelves calls for some systematic effort to induce the dealers in foodstuffs to take all possible precautions in the inspection of the products they distribute. Health and food officials should make every possible effort to bring to the attention of both dealer and consumer the danger involved in handling such products.

SUMMARY

From a survey of the stocks of canned ripe olives by the field force of the Bureau of Chemistry, with the coöperation of state and city officials, during the summer of 1924, the Microbiological Laboratory received and examined over 800 official samples, totalling over 2,900 containers of ripe olives from 30 states, the District of Columbia and Porto Rico. These represented about 20 different packers. The inspectors followed the instructions of the Bureau in sending to the laboratory only the spoiled or suspected material found upon the shelves of dealers. The samples are not reported as representative of the stocks of ripe olives on hand, but as products offered for food purposes, which are in themselves significant.

Spoiled or questionable products were not confined to the packs of particular companies or to any particular region or city. All regions surveyed yielded containers of ripe olives showing some type of objectionable condition.

Spoilage as encountered included: off but scarcely describable odors, metallic odors, sour, butyric and putrid odors, as well as occasional disintegration. Some containers showed markedly colored liquid; some had lacquer partly dissolved or entirely removed in spots; others had suffered corrosion of the metal, varying from etching of the interior of the can to almost complete disappearance of tin wherever the olives or their liquor came in contact with the metal.

Information obtained by the inspectors from the trade indicates that many of these samples had remained upon the dealers' shelves for several years. In some cases the period was known to the dealer; again the entire record had been lost. So long as corrosion had not perforated the cans, many dealers seemed willing to keep them on sale.

Bacteriological examination correlates satisfactorily with inspection as to physical soundness, in showing that canned ripe olives which were free from swell, from abnormal odor, or other marks of spoilage, were not dangerous. B. botulinus was not found in any sample. The investigation furnishes no ground for attributing special danger to the consumption of canned ripe olives, if reasonable care is exercised to exclude spoiled products from sale or use.

In spite of all the skill and care exercised by the packer in the selection, processing and inspection of his product, defective containers of food do reach the retailer. Well packed products also deteriorate in the lines of distribution. To prevent the sale and consumption of such spoiled products, a campaign of education as to the criteria of soundness in canned food should be carried through every grade of dealer and to the consumer.

As a part of the information needed to prevent the accumulation of old and progressively deteriorating material upon the dealers' shelves, every can should be plainly marked with the year of the pack, with some limit of guarantee, or should in some other manner furnish adequate information upon which the dealer and consumer may avoid the handling of such unfit products.

WHAT THE ENGINEER CAN AND SHOULD DO TOWARD PREVENTION OF MALARIA AND MOSQUITO NUISANCES

J. A. LePRINCE

Chairman, Committee on Engineering of the National Malaria Committee, Memphis, Tennessee

Read before the Sanitary Engineering Section of the American Public Health Association at the Fifty-third Annual Meeting at Detroit, Michigan, October 20, 1924.

PROMINENT engineering journals recently commented on the memoirs of Ronald Ross, the pioneer in malaria elimination, but omitted mentioning the fact that much of the future success to be achieved along this line, as well as the methods to be followed, must be devised or created by engineers.

Ross did not stress the point, although it is true, that due to engineering practice as now carried on, the engineer is frequently responsible for the creation of mosquito pest nuisances as well as the spread of malaria, or as an American malaria field worker remarked, "How long will it be before our engineers stop building malaria in, instead of building it out?"

Much man-made malaria or "engineer-made Anopheles production" is going on in other countries as well as in our own, and the time is at hand for our engineering societies to inquire why this is so, and to determine what should be done about it. Some of our engineers at Panama, during the canal construction period, considered the anti-yellow fever and anti-malaria measures as more or less of a joke, and referred to the field workers as "mosquito chasers."

Eight years later, the chief engineer of one of our largest American corporations working in a foreign country was selected and appointed to direct measures against yellow fever which at that time threatened their business interests. He promptly ordered one thousand tents, employed several hundred men to do work that had no relation to the problem involved, and wasted many thousand dollars, but did not accomplish one cent's worth of results toward yellow fever control or elimination.

During the recent epidemic of dengue fever that swept through our southern states from the Atlantic Ocean to Texas, no reference was made by our public press, engineering publications, or engineering societies, to the fact that our street storm water catch basins, present by hundreds in many cities and towns, are sources of millions of the mosquitoes involved in mosquito-borne disease. Yet, without question, a well selected committee of our American sanitary engineering associations could devise an economical modification for the catch basins now in use, so they would become self-draining and no longer a potential or actual menace to the health of the communities where they are now used.

An earnest effort was made recently by the Committee on Engineering of the National Malaria Committee to correct these and other defects and to so arrange that engineering students of our technical schools could learn in a short time, by a single lecture if necessary, not to permit engineering construction operations to become a source of serious epidemic disease outbreaks.

Unquestionably, more far-reaching results could be obtained if some of our prominent engineering associations could be interested in this matter and determine what is being taught in our technical schools relative to that part of applied public health that will be of actual use to our future engineers, and also determine which of these schools show the

students where they can easily and quickly obtain such facts—should they some time later have occasion to need them.

Also, these same associations through their professional journals could at least invite attention to the necessity of practicing and consulting engineers considering the public health problems involved in or connected with many engineering operations, such as irrigation, major drainage projects for agricultural drainage, impounding of water, extension of town suburbs, construction of highways and railroads, sewer outlets, borrow pit construction and similar projects.

Apparently the essentials of this subject, or the relation of engineering construction to public health problems, should in a brief way be presented to all students in our army engineering school, so that any small but very necessary item of expenditure necessary for malaria control in connection with government impounded water projects, or other large engineering projects, could and would be made and included in the appropriation or budget before the project is started. It would be too late to try to apply a remedy after the country surrounding the project is rendered unfit to live in.

In order to make this paper brief and to the point, a partial list of what the engineer can do is given below, and it is hoped that your association, coöperating with other engineers, will determine what should be done and then start devising means for accomplishment.

WHAT THE ENGINEER CAN DO

(a) Devise a means of presenting this subject before the national and state engineering associations.

(b) Obtain the coöperation of these associations so that a practical plan can be adopted to prevent the constantly changing county highway commissioners and county highway engineers allowing borrow pits and roadside ditches to be so constructed that they become intermittent or permanent sources of malaria-bearing mosquitoes and sources of potential foci of malaria.

(c) In this connection in each state, for the benefit of the roads as well as the proper drainage thereof, there should be a state association of county highway commissioners, and the county and state highway engineers should attend the annual meeting of that association.

(d) A strong effort should be made to interest the general managers and chief engineers of the railroads in the malaria belt of the United States, in the financial losses now caused to railroads by malaria, including:

Inefficient labor employed
Increased labor turnover
Retarded development of territory served
Decreased output of mills and manufacturing agencies
Reduction of freight hauled

(e) The state engineering associations should be invited to investigate the anti-malaria operations being carried out by the state board of health of their state, and act as a body in endorsing or giving constructive criticism on what is now being done toward malaria elimination, rate of control progress, and like matters.

(f) The engineer should interest consulting and municipal engineers in the mosquito problem, and let a sufficient number of them understand that a relatively mosquito free community will suffer from heavy mosquito infestation as soon as water of natural drainage courses becomes polluted with sewage water; that the production of pestiferous mosquitoes in clear water as against strong sewage polluted water may be as 1 to 1,000.

(g) The engineering profession must let the local government officials and the public know that sluggish water courses in town suburbs are a public nuisance; often the main source of our town mosquito pest problem, and frequently a menace to health. In the malaria belt of our country the normal (non-storm water) flow should travel through a properly devised concrete lined section in the bottom of the water course, or by pipe line to a point beyond mosquito flight range.

(h) Our underground culverts used in place of large pipe, and carrying a small normal flow of water, should not have flat bottoms. A depressed rounded central channel along the center line of the floor, and gently sloping

sides, will prevent mosquito production. Long culverts with flat grades to convey storm water under town suburbs are yet being built, and are sources of our mosquito pest. They are frequently so designed or constructed that it is not practical to prevent mosquito production in them.

(i) In view of the fact that state development will rapidly follow the proper development of hydro-electric power, impounded water projects constructed by our Federal Government should be so planned as to produce a practical minimum of malaria, and the methods of malaria control used thereon should be a standard for private enterprises to follow. In the past this phase of the public health problem has not been given consideration.

(j) Most of our practicing engineers, engineering construction corporations and contractors, have not been taught what serious malaria problems are, and do not recognize them at sight. The engineer can build malaria into a community for all time to come or build it out of a community. Which is he going to do, and why?

(k) Such small items as the location of a municipal swimming pool, recreation park, or automobile tourist camp, etc., where no consideration is given to the Anopheles problem near it, can seriously affect the annual malaria rate of the nearby town.

(l) Sir Ronald Ross states that it takes ten years for a nation to get a new idea. It was twelve years after the first successful anti-malaria campaign, carried on by Americans in Cuba, before we started any worth-while similar work in our own country.

Nevertheless, the writer does not accept the idea that it will be another ten years before the engineering profession of our country appreciate the commercial and financial value of malaria elimination.

Possibly greater progress has been made in our country than in any other in devising more economic and more rapid control measures, but the rate of progress can be increased tenfold if our American engineers will become seriously interested in this subject which affects the normal development of thirteen states and the comfort of the public in many others.

Malaria in Southern Georgia.—The roads are in many cases flanked on either side by cypress swamps. The trees rise out of two to three feet of algæ-covered water. When close to human habitation these swamps provide ideal breeding places for the malaria bearing mosquito. Drainage is practically impossible; therefore the only solution would seem to be to remove the people. In the low hilly country, these mosquitoes breed in lime sinks, and if they are not too numerous, the larvæ may be killed. The borrow pits also provide an excellent place for the *Anopheles* to deposit her eggs.

Frequently the plantations are surrounded by swamps, and most of the children and young adults have malaria. The lumbermen too suffer, since they must live in or near the swamp in order to cut cypress and pine. But those in charge of the lumber camps are making every effort to protect their workers by providing clean, well-ventilated, screened houses. The plantation houses, on the other hand, are ugly and ill-kept. The negroes are not jolly and care-free, but slow moving and anemic hosts for the malaria parasite.

The "poor white trash" inhabiting the section below the Black Belt are a miserable lot, thousands of them being infected with malaria and a large proportion having hookworm. Their complexions are pale and sallow, and their blood placed on a glass slide is pale orange, not red. Their chief diet is corn in some form.

"The crying need of these forlorn and God-forsaken people is a little divine discontent." They are too willing to accept things as they are, and too poor to make any move.

The solutions to the problems of malaria and hookworm are quite clear—draining, screening, furnishing shoes to the people, and teaching them cleanly habits, but "the whole thing is as simple and easy as it would be for a one-armed man to empty the Great Lakes with a spoon."—"Malaria," Thomas J. LeBlanc, *American Mercury*, Sept., 1924, pp. 366–371.

IODINE IN NUTRITION; GOITER AS A NUTRITIONAL PROBLEM

REPORT OF THE COMMITTEE ON NUTRITIONAL PROBLEMS

Presented to the Food and Drugs Section of the American Public Health Association at the Fifty-third Annual Meeting at Detroit, Michigan, October 21, 1924.

IN 1895, Baumann discovered iodine in the thyroid gland. Subsequent work showed that this iodine is intimately connected with the activity of the thyroid. The characteristic physiological effects of administration of thyroid gland appear to be directly proportional to the iodine content of the gland administered.

In 1914, Kendall isolated from thyroid a pure crystalline substance containing 65 per cent of iodine, which substance he named "thyroxin" and showed to be capable of exerting the characteristic effects of thyroid upon metabolism. Whether or not the thyroxin thus obtained by Kendall in the laboratory is absolutely identical in every respect with the thyroid hormone as secreted by the gland, there is no doubt that this (the thyroid hormone) does contain iodine as an essential element. The thyroid utilizes inorganic iodine (iodide) in the preparation of this hormone. Normally the small amounts of iodine contained in food and drink furnish sufficient iodide for the proper functioning of the thyroid gland and the production by it of the hormone needed to regulate metabolism throughout the body.

When the amounts of iodine furnished by the food and drink are insufficient, the thyroid gland becomes enlarged. It is now generally agreed that this is the cause of most simple goiter, and that simple goiter is, therefore, in its origin an iodine-deficiency disease.

Seaweeds and sea water have long been the familiar sources of iodine. In regions where the food comes largely from the sea, and the atmosphere and drinking water are constantly receiving the iodine-containing salt spray blown in from the sea, the intake of iodine is presumably almost always adequate and in such regions goiter is very rare; but in regions too remote from the sea or too mountainous to receive significant amounts either directly or indirectly from the sea, goiter is much more common, as in the Great Lakes region and much of the Northwest of the United States, and in parts of Switzerland.

Marine and Kimball, reasoning that if the prevalence of goiter in such regions is due to a lack of iodine it should be preventable by giving iodide to children at the age at which goiter ordinarily begins to develop, obtained permission to try their now classical experiment in the public schools of Akron, Ohio. Here as many as volunteered, of the pupils of the ages known to be most susceptible to goiter, were given small doses of sodium iodide dissolved in drinking water in quantity to furnish from 3 to 5 milligrams of iodine twice weekly over a period of a month, and repeated twice yearly. As is well known, this experiment was strikingly successful. In only 5 cases among over 2,000 treated was there any enlargement of the thyroid gland when iodide was taken, while in a similar number of children of the same age in the same region not taking iodide about 500 showed enlargement during the same time. Hence it would appear that 99 per cent of the simple goiter of this region could be prevented by simple iodide, if means for its universal administration could be found. This work of Marine and Kimball published in 1917 and subsequently[1] has focussed attention upon the relation of iodine supply to goiter both in this country and abroad.

In the three Swiss cantons of St. Gaulin, Berne and Zurich where an attempt was made to give iodide to all school chil-

dren during the three years, 1918–1922, the incidence of goiter was diminished during the three years from 87 per cent to 13 per cent.

Evidently the body has a more or less definite nutritive requirement for iodine as for other essential elements. Qualitatively, this requirement might be stated as a sufficient amount of iodine to meet the daily losses from the body, and maintain within the body such store as is needed to provide for the manufacture in the thyroid gland and the distribution throughout the body of sufficient amounts of thyroxin (thyroid hormone) to support a normal rate of physiological activity.

Attempts to measure the actual quantities involved have now begun to appear. According to Marine, if the iodine content of the thyroid is maintained above 0.1 per cent no goiter can develop. This appears to be a suggestion providing a wide margin of safety. Under conditions of ordinary diet without administration of iodine, the percentage is likely to be lower than 0.1 per cent even in entirely normal glands. In the thyroids of healthy soldiers killed by war wounds, Zunz found an average of about 0.05 per cent iodine, which, as the glands weighed about 26 to 30 grams, amounts to about 15 milligrams of iodine in the thyroid gland of a full grown healthy man. According to the estimates of Kendall and Plummer[2] the rest of the body may be expected to contain about 10 milligrams more of iodine, probably chiefly in the form of thyroxin which has been distributed by the thyroid and is serving to control metabolism in all the active tissues of the body.

Thus the full grown healthy man is estimated to contain in his 70 kilograms of body a total of about 25 milligrams of iodine, equivalent to 1 part in 2,800,000 of body substance, or less than 0.00004 of one per cent of the body weight. Hence it appears that of iodine the body contains only about one-hundredth as much as of iron, which hitherto has been regarded as the essential element occurring in smallest measurable amount, and both the iron and the iodine undoubtedly play indispensable parts in the processes of nutrition and must be supplied in sufficient amounts by food and drink if the body is to be adequately nourished.

In the case of iron the great difficulty of quantitative studies of nutritive requirements lies in the extreme smallness of the amounts concerned in the body's daily intake and output. In the case of iodine this difficulty appears to be increased many fold, as the amounts involved are only about one-thousandth to one-hundredth as great. As a matter of fact, the quantities of iodine in most foods are so small that the analytical methods used in examining foods for iodine have not usually been very conclusive even as to whether iodine is present or absent.

It is sometimes stated or implied that ordinary foods do not furnish iodine and that unless sea foods are used the iodine intake will depend entirely upon the drinking water; but this can hardly be true for in the Department of Chemistry at Columbia University certain families of rats have thrived for fourteen generations upon a monotonous diet of wheat, milk, highly refined table salt and distilled water. Moreover, they have lived in all-metal cages without bedding so that the possibility of obtaining traces of mineral matter by the gnawing of wood was excluded. As rats certainly need iodine, and it is not conceivable that iodine previously stored in the body should suffice for fourteen successive generations, it is evident that what they consumed must have furnished the iodine they needed whether the amounts could be shown by analytical methods or not.

As McClendon has recently shown that milk, and especially milk fat, furnishes iodine in significant quantities, and as it has recently been found that a diet essentially of grains induces goiter in rats, it becomes probable that milk was the chief source from which the rat families

obtained iodine during their long history of subsistence upon a simple and monotonous, but evidently adequate, dietary. From present indications, therefore, it appears probable that milk and green vegetables, classified by McCollum as "protective foods" because of their calcium and vitamin content will also prove of value as dietary sources of iodine.

By this we do not intend to recommend nor even to suggest an exclusive dependence upon any food or foods for protection from goiter in highly goiterous regions. In such regions the deficiency of iodine in soil and water may be such that no locally grown food will suffice to meet the iodine requirement. There are, however, also wide regions which are neither highly goiterous nor wholly immune, in which the amount of iodine supplied by ordinary food and drink is near the border-line of adequacy; and in such regions it might well be that the choice of food with reference to its iodine content (when this shall have been better studied) would suffice to turn the scale from danger to safety, or would to a significant degree improve the margin of safety with respect to iodine as well as other nutritional needs.

The difficulty of quantitative determination of iodine in extremely minute amounts must be expected to render somewhat slow and uncertain the working out of satisfactory data on the iodine values of foods and the quantitative requirements of the body for iodine. Von Fellenberg estimates that the normal human adult requires about 0.000014 gram of iodine daily and that, when larger amounts are furnished by the food and drink, an easily mobilized reserve store of iodine is built up in the body. It is doubtless through the building up of such a body store of iodine that the administration of iodide for from two weeks to one month, twice yearly, by Marine and Kimball proved so effective in preventing the development of goiter throughout the year as above noted.

The prevention of goiter is thus a nutritional problem whose immediate solution depends not so much upon detailed knowledge of food values as upon the use of methods which lie largely in the province of the health officer.

The success of Marine and Kimball in preventing the development of goiter through the giving to the school child by the teacher of a little iodide in an occasional glass of drinking water naturally suggested the addition of iodide to public water supplies, and this has been done in several communities.

Your committee feels that in so far as state-wide use of iodized salt has not been attained, the treatment of municipal water supplies with sodium iodide might well be given careful consideration in regions where goiter prevails. As practiced at Rochester, New York,[3] sodium iodide is added to the public water supply for a three-weeks period, twice a year. About seventeen pounds of sodium iodide is added daily giving a concentration of 2/10,000 of a gram to a gallon, and the cost is in the neighborhood of $3,000 a year.

Two other methods are also receiving much favorable attention: The administration of iodine compounds in chocolate tablets or some equivalent palatable form, and the addition of a small proportion of sodium iodide to table salt intended for household use.

It seems appropriate to quote here from the recent writings of two of our health officials, Dr. Robert Olesen, United States Public Health Service, and Dr. R. M. Olin, Michigan Commissioner of Health, regarding these three methods.

Dr. Olesen summarizes his study[4] as follows:

> It may be stated that while numerous methods of supplying iodine for the prevention of endemic goiter have been suggested, the most favored one at the present time is the administration of a chocolate tablet containing 10 milligrams of iodine in the form of an organic acid. One or two of these tablets, according to the age and requirements, should be given each week during the school year both

to boys and girls between the ages of 11 and 18. Owing to the presence of thyroid enlargements in children less than 11 years of age, prophylaxis should profitably begin earlier than has ordinarily been recommended. The preventive should be used both in children in whom there is no evidence of thyroid enlargement and in those having such enlargement. In the latter instance, however, the exercise of nominal medical supervision is desirable.

The iodine-chocolate combination or other iodine-containing mixtures may be used advantageously during pregnancy, under the direction of a physician.

While individual oral administration of iodine is the method generally employed, the use of iodized table salt holds forth considerable promise as an efficient means of preventing endemic goiter in a wholesale manner. However, the difficulties of gauging accurately the dosage and of excluding from treatment the hypersusceptible are manifest handicaps to its uncontrolled application.

The wholesale iodization of a municipal water supply may be cited as an ingenious method in need of further appraisal before a definite verdict as to its efficiency can be given.

According to the best information available there is little, if any, danger in iodine prophylaxis when it is carried out intelligently. Moreover, the rationale of the procedure is sufficiently sound and the results are sufficiently marked to make its extensive application both justifiable and advisable.

In a later paper,[5] Dr. Olesen continues:

The use of iodized table salt, as pointed out in a previous communication, is practiced extensively and satisfactorily in Austria and Switzerland, but has met with numerous theoretical objections in the United States. Principal among these objections are, first, possible harm to persons with hyperfunctioning thyroid glands; second, excitation of a simple thyroid enlargement into a toxic or hyperfunctioning type; and, third, increased cost of table salt, as an economic factor.

To the first two of these objections it may be said that in the infinitesimal doses conveyed in iodized table salt it is very doubtful whether a deleterious influence can be exerted. It may also be recalled that iodine, when administered judiciously in small doses, favorably influences toxic goiters at times.

According to salt manufacturers, the cost of iodizing table salt ranges between $1 and $1.60 a ton. This cost will in all probability not be borne by the consumer, but absorbed in economies effected in production. In any event the cost to the consumer will be trifling. Iodized table salt should not be regarded as a "cure-all." It will probably not cure a simple goiter, especially one of appreciable size. The primary purpose of the preparation is to aid in providing the iodine essential to the proper functioning of the thyroid gland in thyroid-normal individuals, who compose the majority of the population. The exceedingly small quantity of iodine made available in this way must be skillfully supplemented by physicians when definite thyroid enlargement exists.

. . . . . .

Inasmuch as human beings require a definite and constant supply of iodine in order to function normally, this quantity being estimated as a minimum of 300 milligrams annually, the Board of Health of Cincinnati has been advised to insure the ingestion of this amount by each person.

As the amount of iodine necessary to the maintenance of normal thyroid equilibrium may be transferred through the medium of table salt, which, next to water, is the most common article of food, it has been recommended to the Cincinnati Board of Health that all table salt used in the community be prepared in this manner.

It has also been recommended that the board of health favor the enactment of a federal statute requiring the iodization of all table salt sold in the United States, thereby insuring uniformity of the product and restoring to common salt one of the important ingredients which, when naturally present, is invariably removed in the process of refining. A proportion of one part of an iodine compound such as sodium iodide to 5,000 parts of salt apparently satisfies the requirements.

Dr. Olin in an interesting account[6] of the state-wide survey of thyroid enlargement and the preventive measures undertaken in Michigan writes in part as follows:

The survey showed to us the extent of our problem and it suggested the state-wide remedy. The unvarying relationship between the percentage of thyroid enlargement and the iodine content of the water supplies gave added proof that simple goiter was a nutritional rather than a medical problem. Making

good the iodine deficiency in the state's food supply would solve the problem. The question was how to do this.

Treatment of water supplies was promptly ruled out. This method has been tried and found not entirely effective in several cities. Added to that, it would affect only the cities at best, and our problem was as much rural as urban.

Chocolate iodine tablets are already in use in the school systems of several cities of Michigan. Their effectiveness is beyond question, but, again, this way of solving the problem applies best to cities with well organized schools and continued educational propaganda among parents. It has the added disadvantage of failing to reach two important groups—the expectant mother and the preschool child.

It was clear to us that a condition that was the result of a state-wide food deficiency could best be remedied by supplying that deficiency through an inexpensive and universally used food stuff. Salt was, of course, the logical medium to be chosen, since crude salt commonly contains iodine. Representatives of all Michigan salt manufacturers were therefore invited to Lansing and at an enthusiastic conference the agreement was reached whereby all companies would put on the Michigan market, on May 1, 1924, a new "iodized" table salt. This salt differs from that ordinarily used in only one important particular—it contains 0.02 of 1 per cent of sodium iodide, the sure protection against simple goiter.

The question then became one of popular education, since the use of the salt is entirely voluntary, and the most intensive, state-wide publicity campaign we have ever attempted was promptly launched. More than 500,000 letters to parents have been sent through the school system of the state. Practically all organized groups were circularized. Our lecturers and traveling representatives were especially instructed to spread the news. In short, every avenue of approach to the public that we can possibly utilize we are bringing into service.

The outcome, of course, only time can determine. Whether simple goiter will become a thing of the past in Michigan depends upon the people of the state. We believe that it will.

All students of health problems will watch with great interest the practical development of these methods of preventing simple goiter by insuring an adequate intake of iodine as iodide in drinking water or table salt or as some other iodine compound which can be given in convenient and acceptable form.

Moreover, the three methods now generally recognized may not constitute the only practicable alternatives. Turrentine, of the United States Department of Agriculture, has recently emphasized the possibility that it may prove more advantageous to give iodine in a form less readily soluble and less rapidly absorbed into the circulation than is simple iodide solution, and has advocated the use of kelp, and particularly preparations of the species *Macrocystis pyrifera*, which he finds to be particularly rich in iodine. As quantitatively accurate studies of the iodine contents of different plant and animal tissues become available, it may also be found possible to satisfactorily augment the iodine intake by giving greater prominence in our daily dietaries to those staple foods which prove to be the best sources of this element. Thus iodine content may enter into our future conception of food values as vitamin content has become a recognized factor of food value within the past few years.

Moreover, just as our present knowledge of vitamins shows that they are of great importance in other nutritive relations beside the prevention of deficiency diseases, so the future may not improbably reveal other nutritional benefits to be derived from a proper understanding of the distribution of iodine in foods and its function in nutrition, in addition to the prevention of simple goiter.

H. C. SHERMAN, *Chairman.*

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DIRECT UNIT PHENOL COEFFICIENT

A NEW METHOD

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THE RESISTANCE of bacteria is a most important issue in the estimation of germicidal values. The other factors concerned in any method of determining this activity can be standardized. The adoption of certain standard measures, as strength of disinfectant, time of action, temperature, media, etc., should be governed by application of knowledge possessed. On the other hand, the resistance of bacteria, although subject to wilful modification, is the most difficult factor to control, and for this reason, any method of determining phenol coefficients should be based on this variable property of organisms.

In order to better understand the factors which affect resistance it is necessary to study first the principles upon which living cells are founded, and second the means of deleteriously disturbing vital function.

A study of facts pertaining to living cells shows that those of both the animal and vegetable kingdom possess many properties in common. Briefly, the vital properties common to all cells are irritability, respiration, growth, metabolism and movement. Other commonly possessed characteristics are the semi-solid state, viscosity, colloidal nature, biosmosis and surface tension. All cells exhibit kinetic energy in some form, as light, heat, mass movement or electrical energy, and in addition possess potential energy. All cells are composed of water, inorganic salts and products of fats, carbohydrates and proteins. All exhibit oxidation, reduction, dehydration and hydration, and all have habit and method of performance. All possess enzymes and apparently antienzymes. All maintain the chemistry characteristic of their type in equilibrium and exhibit instability.

From a consideration of these numerous, commonly possessed properties it is logical to assume that there must be at least one principle upon which all cells are based. An analysis of the facts concerning these properties shows that this basic principle consists of a structural plan identical for all types of cells. Space prohibits a detailed discussion of this conclusion and permits merely a description of this universal structural plan.

It can be proved that the water, inorganic salts, fats, proteins and carbohydrates of the cells cannot exist or function individually, and that they are united in the form of a physico-chemical emulsion controlled and guided in normal channels by neuro-electrical forces.

It is of the utmost importance in the study of resistance to consider a living cell as an unstable physico-chemical emulsion held in equilibrium because the problem then becomes simplified to the study of factors which affect and modify the emulsion. The action of these factors can be conveniently described under three classes: first, a disturbance of chemical equilibrium towards stability; second, alteration of the electrical state; and third, alteration of the state of hydration. Many facts are available to prove these points. At any rate, we have on the one hand factors as classified above, operating in a manner to produce conditions unfavorable for the existence of independent cells; on the other hand there is the attempt on the part of the living emulsion to maintain its equilibrium, and this activity is called resistance. Naturally all of the processes involved and means employed are not yet known. However, their ability to adjust themselves to strange environment depends on many factors, for example, changes in reaction

of their surroundings are combated by the buffer action of the contained proteins; changes in moisture content may produce spores; the tubercle and some other bacilli contain many substances which resist untoward changes. Broadly speaking, the greater the power of adjustment the greater the resistance. Specialization either in function or food requirements leads to lessened power of adaptability, hence, a lower resistance. In accordance with this ruling, the pathogens and especially those of selective pathogenicity as the gonococcus, the typhoid bacillus, and the meningococcus possess slight resistance under unfavorable conditions. In contrast to these, the less selective pathogenic organisms as the staphylococci have greater resistance. Proof of this is to be had in the type of food required and again against the action of carbolic acid. A comparison of the resistance of several kinds of pathogenic organisms including staphylococcus and typhoid bacilli under conditions where all units except resistance are equal, shows that the typhoid bacilli and other selective pathogens are much more easily destroyed. This of course is a test against only the power to resist certain chemical change, but sufficient to show the necessity of selecting the most resistant pathogen as the test organism in adopting a method of estimating the relative strength and value of germicides.

The present methods of determining germicidal value have not given complete satisfaction, and considerable difficulty is encountered by the manufacturer in complying with the various federal and state rulings in regard to germicidal values. The present methods depend too greatly on personal equation and too little on standardized units. For example, the time period and the strength of phenol control are variable and are different for each set of tests. The length of time and strength of phenol to kill a definite number of organisms are constant, however, and should be adopted as a standard.

In any method of analysis it is well to have as many constants as possible. Although the selection of a definite time period seems to be entirely arbitrary, there are reasons for the choice of a definite short interval. Germicides in practical application have a minimum of effectiveness whether this is the result of human impatience or the involved chemical conditions. Experience has proved that the average maximum should be five minutes for reliable determination of germicidal value under actual conditions. The apparent discrepancies to this statement are due entirely to the physical conditions involved and not to any differences of chemical action.

An examination of tables made by present methods containing the results of phenol coefficient tests shows that within a period of five minutes the length of time for a definite strength of phenol to kill a definite number of organisms is constant; and that this time period becomes variable after that period. Under those experimental conditions physical factors were removed, and the chemical units were constant, thereby proving, by process of elimination, that the resistance of the strain of bacteria was the variable. This would undoubtedly prove true regardless of type of organism, except in degree.

The strength of phenol selected should be that which exhibits complete destruction of the entire number of organisms within the five minutes. This action should not be instantaneous, but should be graduated so that the action is complete only after three or four minutes. The strength to be selected by experiment and once determined should become a standard, thereby furnishing a second constant, strength of solution, which can always be duplicated.

Present methods contain no such definite time limit or standard single strength of phenol; and in addition employ the typhoid bacillus for the test organism. The argument in favor of this choice is that B. typhosus is claimed to be the one pathogen which is most constant in characteristics; hence, all laboratories can use

an identical strain. As to its consistency of characteristics, the typhoid bacillus is very prone to change. Not only in the Pennsylvania Department of Health Laboratories, but also in others, it has been known to lose its main characteristic, the lack of power to ferment lactose and to acquire the ability to split this sugar.

Again, the typhoid bacillus has been shown to be less resistant and more variable in resistance under different conditions to the action of phenol. Since it is not constant in characteristics, and since it is not exceptionally resistant, it appears to be a poor choice to represent the pathogens and the filterable viruses of unknown resistance. And disinfection has for its aim the destruction of other infectious agents as well as the typhoid bacillus.

On the other hand, the less specific pathogens staphylococci and diphtheroids represent classes which are much more constant in their resistance to unfavorable conditions; hence, are a better choice to test the germicidal action of a substance, and being most resistant will guarantee destruction of unknown viruses better than the less resistant typhoid bacillus. Strains of staphylococci and diphtheroids from any source show a uniform resistance to the action of phenol within a period of five minutes. The choice of staphylococci and diphtheroids furnishes the least variable test groups, and since their resistance under controlled conditions is so nearly uniform, we may say that they furnish a third constant or standard.

How often in determining phenol coefficients do accidents occur, so that when the test is read there is a break in the continuity of findings. Then comes the question whether the organisms were killed in one tube and not in the next, or the turbidity was caused by a contamination, and this necessitates corroboration. The present methods give only presumptive qualitative results and do not furnish what is needed, which is a definite determinative quantitative evaluation of the germicide. The present methods are involved and difficult to perform, and require a great number of tubes and other materials and frequently assistants in the actual performance.

Although the present methods are rather complicated they are limited in applicability, permitting only the testing of germicides incorporated in water or soap emulsions, and cannot be employed with preparations such as ointments.

Results obtained by present methods by different individuals or by the same individual at different times on the same material will vary several points; hence are unreliable in forming an opinion of the true value of the germicide.

With the above points in view an attempt was made in this laboratory to devise a method which would eliminate all of the undesirable features. The Direct Unit Phenol Coefficient was established in the Pennsylvania Department of Health as a substitute for the old and indirect, inconstant phenol coefficient and will be presented herewith in detail.

This method employs a single unit of control phenol solution, a time period of five minutes, two classes of resistant pathogens, controlled environment of the bacteria, and is performed on plates, which permits a direct determinative and quantitative identification of the cultured test organisms.

PHENOL CONTROL

Phenol is used in a 1.75 watery solution. It is prepared by accurately weighing 1 gram of the melted crystals into a weighed beaker, and adding 74 grams of sterile distilled water.

TEST ORGANISMS

A strain of staphylococcus aureus and one of diphtheroids from any source; these are transplanted every twenty-four hours on nutrient agar, which is made from meat infusion broth, bactopeptone and 1½ per cent agar, adjusted to a pH value of 7.6 and slanted in tubes approximately 150 x 16 mm. Incubation is carried out at 37° C.

To prepare for use separate suspensions of both organisms are made by adding 4–5 c.c. of sterile physiological salt solution to the agar growth, washing off the growth and transferring the concentrated suspension to a tube approximately 150 x 16 mm. containing 3 sterile beads, and shaken gently until all clumps have been broken and the opacity is uniform. Sterile salt solution is added in small quantities with agitation of the tube until the markings on a 1 c.c. pipette become visible, when held within the tube against that part of the tube farthest from the observer. At this degree of opacity the number of bacteria is 2,000,000,000 per c.c. Equal quantities of the separate suspensions are mixed and 0.1 c.c., equal to 200,000,000 bacteria, used as the standard quantity in the test.

PERFORMANCE OF TEST

Melt agar of pH 7.6, cool to 45–50° C. and keep it in lukewarm bath.

Arrange six serially numbered and labelled Petri dishes in consecutive order on the table. Arrange the Petri dish for contact by slanting it on another dish.

Place, by means of a large calibre 10 c.c. graduated pipette, 1 c.c. of the preparation to be tested into the contact dish, so that all of the material is on one side. By means of a heavy platinum wire formed in a 4 mm. loop, transfer a loopful of the germicide to the dish labelled germicide control. Add agar and rotate the plate.

Now, at a definite minute, add from a pipette 0.1 c.c. of the mixed bacterial suspensions to the 1 c.c. of germicide. Heat loop and cool either in sterile salt or the cooled agar, and thoroughly mix the germicide and bacteria. At the end of one minute remove a loopful; hold it in the centre of a Petri dish and add cooled agar. Stir vigorously with the wire and rotate the plate. Sterilize the wire, and repeat the transplantation at intervals of one minute for five minutes. Set plates aside to cool.

Repeat this technique, using phenol 1:75 water solution, as the germicide.

Make a control plate of the bacterial suspension by transferring a loopful of the suspension to a dish and adding agar. Make a control of the unmodified agar in order to determine its sterility.

When all plates have hardened, invert and place them in an incubator at 37° C. for twenty-four hours.

READING

Agar control should be sterile. Phenol control should be sterile. Phenol plate 1 should exhibit marked inhibition of growth. The two minute plate should show a still greater amount of inhibition. Plate 3 should be sterile, but may exhibit some colonies. Plates 4 and 5 should be sterile, thereby showing that the bacteria are killed in three to four minutes of contact. The tested germicide plates are compared directly with those of phenol.

In order to obtain some idea of the coefficient of an unknown germicide, several dilutions are made. Each dilution is placed in its contact dish, and seeded at the proper time with the standard quantity of organisms. Instead of making 5 plates at one minute intervals, only 1 plate after three minutes of contact is made for each dilution. The entire five minute plates are run on phenol to serve as a check on the procedure. The strength equalling the three minute phenol plate is then selected for the test of comparative strength. When this is done, the Direct Unit Coefficient is determined by simply dividing the strength of disinfectant by 75, the strength of phenol.

This method furnishes a direct estimation of the number of organisms destroyed, and permits immediate identification of type, as contaminations are easily determined. The symbols employed are: — No growth; + — from 1 to 50 colonies; + from 50 to 200 colonies; ++ from 200 to ∞ colonies; +++ = ∞ colonies. The method has been used for several years in the Pennsylvania Department of Health Laboratory in testing the germicidal value of material incorporated in ointments, as well as those in

water vehicles and has proved to be very economical, easy to perform, reliable and consistent in results, and is adaptable to the testing of materials with organic matter as well as those without.

In the examination of materials selective for gram negative organisms, as acriflavine, the colon bacilli can be very properly substituted as a test organism, since its resistance is equally high and constant.

At present the tests are performed at room temperature, since staphylococci and diphtheroids are not as variable to slight changes of temperature as the less constant typhoid bacilli. But if a constant temperature is required, it probably can be secured very easily by making a simple water bath, heated by electric lamps and regulated by an easily made mercury contact system.

OBSERVATIONS ON DIPHTHERIA TOXOID AS AN IMMUNIZING AGENT

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BOTH diphtheria toxoid and diphtheria toxin-antitoxin derive their immunizing potency from altered diphtheria toxin. The freshly prepared toxin has such an instant action on the human tissues that only minute amounts can be used, and immunization with it is therefore a long drawn out process.

Diphtheria toxoid was used for animal immunization in the first experimental work in producing antitoxin and it has continued to be used to some degree ever since.

The utilization of a toxin-antitoxin mixture by von Behring led to the use by us and others of toxin-antitoxin rather than toxoid. During the past three years Glenny and Hopkins[1] in London and Ramon[2] in Paris have been suggesting the substitution of toxoid for toxin-antitoxin. Independently of them we[3] had begun to test the value of toxoid preparations.

Diphtheria toxin can be changed to toxoid by various means, such as storage at moderate temperatures, heating to 50 to 54° C. for a few hours, or exposure to chemicals.

The accepted method at the present time is to add 0.2 to 0.3 per cent of formalin to the toxin, the amount depending on the protein content and the duration of storage in the incubator.

The advantages claimed for the toxoid are that it is simpler to prepare; is more stable; is somewhat more potent, and it contains no horse serum globulin. In our opinion toxoid is no easier to prepare than toxin-antitoxin. Experience and the following out carefully of every detail of a proper method are necessary in both cases. To the inexperienced a toxoid is easier to prepare because it is a single substance instead of two substances and the difficulty of making a proper mixture is avoided.

The question of stability is more debatable. The longer a toxin is stored, and to a certain extent the greater the percentage of change from toxin to toxoid, the less rapid will be any further change.

The toxin used for toxin-antitoxin is really a mixture of toxin and toxoid. If the toxin-antitoxin mixture is made so that when mixed it has just the right toxicity, it will drop off in potency faster than a toxoid preparation, but if it is made with some excess of toxicity and stored for several months before it be-

comes suitable for use it will then remain as stable or nearly as stable as the toxoid preparations.

The objection that toxin-antitoxin has a minute amount of horse serum globulin, and as shown by Hooker suffices to cause a moderate serum sensitization, has some weight. It can be obviated by following the suggestion of Hooker of using goat antitoxin. Banzhaf has already prepared such a preparation, and this has been used in a number of children by Schroder and Zingher. Re-tests have not yet been made. We have never seen any dangerous reactions following the use of serum in those who previously had toxin-antitoxin. We feel certain that there is no objection to giving previously injected children an intramuscular injection of serum. We need more experience before being as sure as to the effect of this slight degree of sensitization on the reaction to an intravenous dose. There is a tendency to attempt to use a toxoid or a toxin-antitoxin preparation that has no toxic effect on guinea pigs. This is very effective in animals, but has a decided drawback. Thus the toxoid sent us by Dr. O'Brien from the Burroughs Wellcome laboratory can be given in 5 c.c. doses to guinea pigs, and has remarkable immunizing potency in this dose. In man, however, one-half a c.c. is advisable because the pseudo reaction to the bacillus proteins makes too severe a local reaction. It practically is the same as the old 3 or 5 L plus preparations. The comparative reactions from 1 c.c. and from ½ c.c. of the non-toxic toxoid and 1 c.c. of the 1/10 L plus toxin-antitoxin are shown in Table II. Glenny and Hopkins and Ramon believe that the amount of absorption of antitoxin by a preparation is a pretty exact index of its immunizing power.

This may be true as between different preparations made in the same dilutions from the same materials, and as far as possible in the same manner, but it is far from true if used to test preparations made in different ways and of different degrees of toxicity. The larger the amount of the original toxin in the human dose, the greater will be its antitoxic neutralizing value.

Table I shows the relative absorption of antitoxin by a human dose and the relative potency of different toxoid preparations, as judged by the immunizing re-

TABLE I

Preparation	Human Dose	Units of Antitoxin bound by the test dose	Toxicity in 250 grown guinea pigs	Human Doses used as test injections in guinea pigs	After one Dose and one Schick test Percentage of 15 guinea pigs giving a negative Schick reaction at end of four weeks
B. Wellcome Toxoid 1923	0.5 c.c.	3.5	5 c.c. no effect	2.0	70
Same 8 mos. later	0.5 c.c.	3.5	5 c.c. no effect	2.0	60
B. Wellcome Toxoid 1924 preparation	0.5 c.c.	3.5	5 c.c. no effect	1.0	35
Banzhaf 0.25% formalin Toxoid 437	0.5 c.c.	2.5	5 c.c. sl. paralysis	2.0	76
Toxoid 350	0.5 c.c.	2.5	5 c.c. died 18 days	2.0	70
Banzhaf 0.1% formalin Toxoid 437Z	0.1 c.c.	0.37	0.2 c.c. sl. paralysis	1.0	15
Toxoid 377Z	0.1 c.c.	0.20	0.2 c.c. sl. paralysis	1.0	50
Banzhaf heated 54°C. 5 hrs. Toxoid			5 c.c. no effect	1.0	24
Toxin-antitoxin as comparison T.A. 110 0.1L plus			1 c.c. paralysis 21 das.	0.5	85
T.A. 69 0.1L plus			5 c.c. paralysis 27 das.	1.0	65
T.A. 86 0.1L plus			1 c.c. paralysis and recovery	0.5	10
T. A. Solution of precipitate from mixing Toxin and Antitoxin					
Precipitate of toxin 377 Banzhaf			1 c.c. kills 30 days	0.2	80
Precipitate of toxin 517 Banzhaf			1 c.c. slight paralysis	1.0	100

TABLE II

COMPARISON BETWEEN THE REACTIONS DUE TO THE SUBCUTANEOUS INJECTIONS OF THE NONTOXIC TOXOID (BURROUGHS WELLCOME & CO.) AND THE STANDARD 1/10 L PLUS TOXIN-ANTITOXIN IN CHILDREN (SCHRODER).

29 children (Schick + 10 Schick — 19) receiving 1 c.c. of toxoid. Subcutaneous reaction + 16; ± 9; ∓ 3; — 1.

23 children (Schick + 9 Schick — 14) receiving 0.5 c.c. of toxoid. Subcutaneous reaction + 5; ± 12; ∓ 3; — 3.

29 children (Schick + 5 Schick — 24) receiving 1 c.c. standard 1/10 L plus toxin-antitoxin. Reaction + 6; ± 6; ∓ 4; — 13.

Average diameter of the 1 c.c. toxoid reaction 5 cm., 1/2 c.c. toxoid 1.7 cm., 1 c.c. T-A 1.7 cm. One c.c. of undiluted toxoid gives a larger percentage of pseudo-reactions and more intense reactions than the 1/10 L plus T. A. The 1/2 c.c. dose of toxoid gives a greater number of marked pseudo-reactions but of no greater intensity than the 1/10 L plus T.A.

sults in guinea pigs of a single injection followed by a stimulating Schick test at the end of the third week and a final Schick test at the end of the fourth week. A completely negative Schick test is considered as indicating immunity.

The results of these tests indicate that the best toxoid preparations we have at present are nearly, but not quite, as effective as the best toxin-antitoxin preparations. If only the non-specific proteins could be removed, larger doses of toxoid could be used, and even better results obtained.

RESULTS OF IMMUNIZATION IN MAN

One c.c. of original toxoid 377 diluted 1 in 14 to 1 in 20, given to 659 children originally Schick positive, when re-tested by Zingher four to six months afterwards gave 448 negative reactions, or 68 per cent effective results. Schroder gave three injections of the same preparation to 187 adults with 87 per cent apparent success. As control tests were not used by Schroder with the first injections this should be reduced to about 80 per cent.

With toxoid 437, Zingher got better results—1,525 children giving a positive reaction received three injections of 1 c.c. of a 1 to 20 dilution of the original toxoid. At the re-test two and one-half to three months later, 1,342, or 88 per cent, gave a negative reaction.

Comparing the results we find that toxoid 437, containing a larger amount of antitoxin neutralizing substance, gave the better results in man, but the force of this observation is lessened by the fact that in the test on guinea pigs the reverse result was obtained.

The local and constitutional effects of the diluted slightly toxic toxoid as noted by Zingher and Schroder were very similar to those following the standard 1/10 L plus preparation of toxin-antitoxin of the same toxicity.

The reaction following the use of nontoxic toxoid was wholly due to the proteins, as there was no active toxin present. In Table II a comparison between the Burroughs and Wellcome toxoid and toxin-antitoxin is given.

SUMMARY

At the present time toxoid preparations have been developed which are nearly, if not quite, equal to the best toxin-antitoxin preparations. The toxoid preparations which have no toxicity in guinea pigs cannot be properly used in human beings in doses larger than ½ c.c. because of the marked pseudo-reactions. Toxoid that is slightly toxic can be diluted at least ten times and so reduce the amount of proteins. It is a question whether the slightly toxic diluted toxoid preparations are as stable as the nontoxic ones. Intensive experimental work should be done in both toxoid and toxin-antitoxin preparations so as to be able to constantly have thoroughly potent and stable preparations. After one or two years we should be able to decide which has the greater advantages.

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PREVENTIVE MEDICINE IN INDUSTRY

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President Michigan State Council on Health

Read before the Public Health Administration Section of the American Public Health Association at the Fifty-third Annual Meeting at Detroit, Michigan, October 20, 1924.

PREVENTIVE MEDICINE has passed through several stages of development. First, its attention was directed almost entirely to sanitation in the sense of cleaning up back yards, garbage heaps, etc., and the main work of a health department was under the supervision of a so-called sanitary inspector. Then came the era of quarantine, with special attention to the restriction of the spread of contagious diseases. Although the latter activity is still part and parcel of preventive medicine as practiced by public health officials, the principal work done in preventive medicine today is of an educational character. The science has advanced so that now it is the principal duty of a public health official to teach the people at large how to keep well, how to practice personal hygiene.

Industrial medicine, on the other hand, had its beginning in the doctor attached to a lumber camp or a mining industry. Such medical attention was a necessity because frequently these industries were located in more or less remote districts where it was practically impossible to obtain other medical aid. The service rendered proved so valuable, however, in keeping employes fit, that gradually its scope was extended until now there are physicians and entire medical departments attached to all kinds of industries, with a view not only of rendering first aid but of teaching the prevention of sickness as well as of accidents. In 1914 the Conference Board of Physicians in Industry was formed. The membership of this board now comprises 29 physicians devoting all or a major part of their time to industrial practice and representing industries which employ about 400,000 workers. At a meeting held by the Conference in 1922, the following definition of the medical man who devotes his time or part of his time to industry was outlined:

"The physician in industry is one who applies the principles of modern medicine and surgery to the industrial worker, sick or well, supplementing the remedial agencies of medicine by the sound application of hygiene, sanitation and accident prevention; and who, in addition, has an adequate and coöperative appreciation of the social, economic and administrative problems and responsibilities of industry in its relation to society." Accepting this definition as describing the work of the physician in industry, it is evident that preventive medicine has a place there. Industrial medicine is developing, just as preventive medicine has developed, to the point where its chief work and the chief duty of its physicians is educational.

Analyzing the simple truths set down in these introductory remarks, we find that as preventive medicine and industrial medicine develop they draw more closely together, and the work of each becomes involved in the work of the other. There seems to be no better place to work out the latest phase of preventive medicine than in a well-organized industry. Here is a group that can, if the employer so wills, be controlled sufficiently so as to be taught how to keep well. It can be kept under observation to such an extent that the results obtained can be easily tabulated. It is to be borne in mind, however, that the labor turnover which exists to some extent in every industry, will interfere with the preventive program. To accomplish the best results, the following should be some of the functions of the medical department of an industry:

The examination of all applicants for employment.

The periodical reëxamination of all employes.

The examination of any and all employes who may be indisposed, for the purpose of diagnosis and advice.

The examination, upon request, of all employes who may be under the care of an outside physician, for the purpose of cooperation and consultation.

The surgical care, as far as possible, of all company accident cases.

General health education by means of literature, lectures, bulletins, etc.

General supervision of plant sanitation including such matters as ventilation, heating, food inspection, etc.

Investigation by nurses of all sick cases and general nursing care and advice, as far as possible, of all such cases.

The examination of all applicants upon admission is necessary for the purpose of classification and as a matter of record. All candidates graded A and B will be accepted; the only difference being that those graded A will be considered physically fitted for any duty, while those graded B may have a defect which will limit their usefulness to certain definite employment, or they may have a corrective defect the removal or correction of which will put them into the same position as applicants graded A. Only applicants graded C will not be recommended for employment because their physical condition will be found to be such that they will become a menace to themselves, to their fellow employes or to property.

Periodical reëxaminations are the most important step in the preventive program. By this means diseases may be discovered in their incipiency, and helplessness on the part of the employe prevented. These examinations are of importance to the community and to the medical profession because of their educational feature. If the workers in the various industries can be taught practically the value of periodical examination, they will see to it that similar examinations are made by their own physicians of their wives and families.

In this work, as conducted by the Michigan Bell Telephone Co., the principal defects discovered are incipient tuberculosis, chronic appendicitis and diseased tonsils. In an age group such as ours, between twenty and thirty years, it would be expected that tuberculosis might be quite prevalent, and yet these entrance examinations and reëxaminations make it possible for us to keep the number of cases down to a minimum.

To every employe should be extended the privilege of calling at the medical department whenever he or she is indisposed, for examination and advice. After a careful examination has been made the employe should be advised what to do, being referred to his or her own physician, to some other competent physician, or to a specialist if the case demands it.

The medical department should keep in touch with the case through the attending physician by means of written reports or telephone communication. Thus, many cases will be discovered which would otherwise go unnoticed, because the employe would let the case run on without any medical aid until it became more serious. The privilege of going to the medical department will in many cases prevent the practice so common among workers of giving each other advice, which in many cases consists of recommending some quack or illegal practitioner, instead of a registered physician. Here then we have another opportunity of extending the practice of preventive medicine to the community of which our particular industry is a part.

The facilities of the industrial medical department should be placed at the service of the attending physician whenever he desires it. X-ray and other laboratory examinations should be made at his request for employes of the particular industry, and the results placed at his disposal. This practice is of advantage to the physician in making his diagnosis and, therefore, the community at large.

The surgical care of industrial workers is prescribed to some extent by the Work-

men's Compensation Law, which provides rather definitely that proper surgical aid shall be furnished by the employer. Whether that is done directly or indirectly is immaterial, except that the physician connected with the industry should have in mind not only the recovery of the injured employe, but his rehabilitation, and in this respect his viewpoint will sometimes be different from that of the attending surgeon. The greatest work accomplished by industrial surgery is such work as that led by Dr. Harry Mock, of Chicago for the rehabilitation of the injured. On the other hand, first aid and even the entire treatment of minor accidents frequently is, and rightly should be, looked after at the medical department of the particular industry. Accident prevention is of importance and deserves mention. By the installation of safety devices, attention to good lighting, and similar precautions, many accidents may be prevented. The best work in this line is done by campaigns of instruction carried on among the employes. Such campaigns are of importance to the community at large because the employes carry their knowledge of accident prevention to persons outside their particular plant.

Under other headings, I have mentioned some of the preventive measures which should form further duties of the physician in industry. He should practice preventive medicine in his group by giving lectures and distributing literature for the education of the employes in hygiene and sanitary science, and he should supervise the sanitation of the plant and make periodical inspections with reference to heating, ventilation, lighting, food, etc.

The duties of the nurse in industry are manifold, but are so evident that they hardly need further comment. She will aid the physician as an office assistant in all of his work, both medical and surgical, and her outside duties will consist largely of following up the sick cases and keeping the company, through its medical officer, in touch with the progress of the case. There can be no question but that the services of nurses in industry have proved their worth to all concerned.

To the above mentioned functions of an industrial medical department may be added others, and in particular I may mention a prophylactic dental department. The value of this work as applied to school children has been well established by boards of health, and endorsed by dental societies, and it is of no less value to adults engaged in various occupations. The medical department makes recommendations with reference to the care of the teeth, which would be more frequently carried out if a start could be made by the practice of prophylaxis at the hands of a trained dentist at the medical department, and further instruction given the employe in a practical way as to the need of dental work for the preservation of his health. For such work he would, as a matter of course, be referred to an outside dentist.

It will be seen from what I have said that the physician in industry is really the health officer of his group, and his department is the health department of his industry. Preventive medicine in such a group, carried out as I have described it, would be one hundred per cent perfect were it not for one obstacle—the almost constant labor turnover.

But even in spite of this turnover, the benefit derived by the employes who remain with the given industry for several years or more makes such a preventive program worth while. There will be enough good accomplished so that the result will mean for the employes the promotion of health and the prolongation of life; for the employer increased efficiency on the part of his workers, and a subsequent reduction in production expenses; for the community at large a better citizenship; for the medical profession a greater demand for their service by a more enlightened clientele and for the physician in industry the satisfaction of having done a good and worthy job.

BOSTON'S NEW HEALTH UNIT

ON November 1 there was dedicated in Boston a new health unit. The ceremony was replete with the sympathetic emotion which the inauguration of a coöperative enterprise demands. The headquarters of this center were built from the income of the George Robert White Fund. The building is situated in the North End of Boston, and is known as the First Health Unit, although Boston has already experimented with the health center plan at Blossom Street and elsewhere. It is expected that other health centers will be established out of the income of the fund to serve other sections of the city. Boston is thus assured of a complete system of health centers.

The complete proceedings were of unusual interest. All of the addresses were extraordinarily free from the cold formality of high phrases and rhetorical sentences that often characterize such occasions. The quiet human warmth of the remarks of Mayor Curley did much to give the occasion its appropriate emotional atmosphere, and the JOURNAL considers itself fortunate in being able to present for the stimulation of health workers everywhere the addresses of Dr. Emerson and Dr. Vincent which only a few were privileged to hear.

REMARKS OF DR. HAVEN EMERSON

Aladdin has certainly come to Boston. A miracle has transformed what I learned some years ago to believe was a health center, from a tenement apartment, resembling a trolley car in proportions, and a corner saloon in its setting, to this palace of prevention, this beautiful home of health.

The history of health is so much oftener marked by the quiet report of a modest student in the hospital or laboratory, that a great civic gesture such as this calls for joy and exultation that Hygeia, the goddess of Health, has at last a temple worthy of her.

The tablet over the entrance dedicates this building to prevention.

All the spirit of the honored and powerful town hall of New England, that training school of citizenship, and of self-expression, is brought to life again in this the visible symbol of all those gentle services upon which family and neighborhood life depend. There are few sweeter words than that of neighbor, few greater satisfactions than being a member of a community conscious of itself.

Great cities are nowadays threatened by their size, not only through the hazards of mass existence shown in our crowded streets and still more in the stifling tenements, but by the disintegration of social relationships among neighbors, and the lack of touch between the citizen and his servants in public employ.

We have long been accustomed to the friendly school building, the library, the church centers that bind neighborhoods with a common interest, and it has been only within the past twelve years that our rapidly spreading respect for medical science and the services of health protection has developed a call for the neighborhood house of health. Here we have a service station, distributing currents of protection, circulating friendly service, advertising the most unselfish of commodities —a better quality and greater quantity of life. Here is the year round office of the practitioner of health, the district health leader.

On this occasion Boston has scored priority in a notable health accomplishment, as her officers or her citizens have on numerous occasions in the past.

For the first time on this continent a quarantine was established when the town officers of Boston, in 1678, forbade the unloading of cargo or debarkation of passangers or crew from ships which had brought smallpox with them from England.

School medical inspection began, for the United States, in this city. A public clinic organized for the study and prevention of the hazards of occupation was first accomplished in Boston to the everlasting benefit of the wage earners throughout this country.

Here and now we have that fortunate combination of private generosity, faith in public officials, and administrative ability among technical services, by virtue of which the first district building erected by a city government is devoted exclusively to the use of official and private health agencies.

This signifies much more than the humanizing of a central bureaucracy, which health departments tend to become. We have this building as a token of widespread belief that the nearer public service comes to the householder and his child, the stronger is the faith in democracy, the greater is the trust in elected officers. This is more than a new facility of and for the city government; it is an expression of hospitality by the officers who bear the mandate of the voters, to the volunteers who have so often blazed a path of health with private endeavor, gladly followed later by the more ponderous and burdened government departments.

We are so close to the origin of health centers, so young in our effort to bring unity of effort into the local life of unlike districts of our cities that it is easy to mark the steps of progress. Appearing first across the Alleghenies where a resourceful leader in the tuberculosis campaign gave Pittsburgh the example of what could be expected from a common meeting place and office of the volunteer servants of the sick, we see a similar idea in Milwaukee devoted to the saving of babies' and mothers' lives, Philadelphia, New York and Cincinnati testing, approving and adding to the plan.

Not until 1914 was there any evidence that this glimpse of a new method in health administration had opened out in the minds of health officers. Down in a tenement store of Division Street in New York's Ghetto, in the shadow of a block, where still almost a thousand persons crowd the acre, the first experiment station under municipal auspices was started as a health center, with a desk and chair where the visiting nurse and the charity worker could take turns at the 'phone and swap notes on common problems with the district physician and the sanitary inspector. The germ of this embodiment of local health administration was contained in those cramped quarters.

In the same year, Buffalo made use of district dispensaries with the same idea, and in 1915 Cleveland put its city health stations on a district basis. But it has remained for private generosity, the imagination and creative loyalty and experience of volunteer health agencies of Boston, to clothe the idea with the enveloping beauty of architecture, and breathe into the faint hopes of others a spirit and practical organization which promptly takes the present project out of the class of experiment and places it among the permanent features of civic government.

What is to be the purpose? How will organization be developed? What are the methods to be evolved out of this venture?

For purpose we have the translation of the quickly following facts of science into language, habit and use of households, interpretation by the busy messengers of health, of theory and practice of life in terms of kitchen, playground and nursery. From this welcoming, receiving station, as full of wisdom as this room is of the flooding sunshine, it will be the purpose of the doctor, nurse and all variety of friendly visitors to distribute as rapidly the good news of living as in the

past the hurrying ambulance has raced with death through the streets. It will be the purpose of the health officer, the district agent of city service to use this as a transforming station, to short circuit the knowledge of mankind for the better illumination of his local community.

The organization comes ready to hand, simple and practical from the lessons of well-tried executive practice. Each public and private health function will be served as if by an embryo bureau of a central government through a personnel that deals directly with each household, and all guided by the district health officer, the community physician.

The methods will be those of education, not enforcement, persuasion, not authority, of example, not of threats.

In searching for suitable words to express the soul of this unit I came upon verses of that great sanitarian, the wise physician, the poet of American Medicine, to whose science and teaching we owe the saving of whole armies of the mothers of the land, Dr. Oliver Wendell Holmes.

As Life's unending column pours,
  Two marshalled hosts are seen—
Two armies on the trampled shores
  That Death flows black between.

One marches to the drum-beat's roll,
  The wide mouthed clarion's bray,
And bears upon a crimson scroll,
  "Our glory is to slay."

One moves in silence by the stream,
  With sad yet watchful eyes,
Calm as the patient planet's gleam
  That walks the clouded skies.

Along its front no sabres shine,
  No blood-red pennons wave;
Its banner bears the single line,
  "Our duty is to save."

And if I may be pardoned the flight of fancy, let me say that while we have in tumultuous and often bloody manner declared our independence in religion, in education, in government, we still await the revolution in

thought and action which will culminate in a declaration of freedom from disease. Let this building prove to be the Faneuil Hall of Health.

REMARKS OF DR. GEORGE E. VINCENT

In grateful contrast with the acrimony, clamor and clashing interests of the culminating political campaign, we are met in peace, concord and goodwill to open formally to the citizens of this district their own House of Health. Here the city's official staff and the workers of many voluntary societies will put at their service resources of knowledge, skill, counsel and friendliness.

This event closely follows others which have brought new distinction to this historic city. A year or more ago the opening of the Thorndyke Memorial notified the country that Boston regards municipally supported medical research as essential to the best care of the city's sick. Only the other day a splendid new wing of the City Hospital was put in service. The recent taking over by the city of health work which had been developed under private auspices is highly significant. Progress in municipal medical care and protection of the people's health are becoming a Boston habit.

Dr. Haven Emerson has given an informing account of health center development, and has clearly described the purpose, organization and methods of this relatively new social agency. It remains for me to suggest and to characterize briefly some of the meanings with which this ceremony is fraught.

We celebrate: The generous gift of a loyal private citizen to his municipality; the wise statesmanlike decision of trustees to use this gift first of all for the public health; the leadership of the Mayor in advocating the plan and in securing guarantee of maintenance from public funds; the transfer to municipal control of health services built up by voluntary effort; the continued coöperation of municipal and of nonofficial agencies; emphasis upon prevention of disease rather than upon medical treatment; the creation of a model institution which will have a nation-wide influence; a concrete expression of community spirit.

George Robert White gave evidence of his loyalty to Boston during his life. The Massachusetts School of Pharmacy building, for example, was his gift, and testifies to his interest in medicine. But the fund he bequeathed for the direct benefit of the city is notable. He showed confidence in the citizens by vesting the control in five trustees, a majority of whom are municipal officials. He shrewdly limited gifts to capital expenditures for buildings and grounds which must be maintained at public expense. He insisted upon keeping the public informed by the issuing of annual reports. Mr. White had faith in the people of Boston and in its government. He believed that the way to evoke responsibility and fidelity in public officials is to show confidence in them.

Today Mr. White's faith finds justification. The trustees of the fund have shown wisdom and imagination in recognizing the basal importance of the public health and in deciding to create units like this as centers of a city-wide system of coöperative service by both official and voluntary health and social agencies.

To the Mayor this must be a welcome day. He sees the fulfillment of a plan of which he has been a persistent advocate. There have been doubts and obstacles. The public has a fancy for ornamental and conspicuous civic buildings and monuments; it is not easily excited by so dull a thing as health; and it hates to pay taxes. It took faith and steadfastness to carry through this project. Public appreciation and approval may be counted upon as the program develops.

The recent taking over by the Boston Health Department of infant welfare work and nutrition service which had been developed by nonofficial associations, and the setting up of dental prophylactic stations in affiliation with the Forsythe Clinic was what ought to be a typical procedure. It shows what a private enterprise should try to do, namely, as Dr. Livingston Farrand has said, to "put itself out of business." While the city was properly giving first attention to sanitation and communicable diseases, the voluntary groups carried on demonstrations in the field of hygiene. Here was a convincing experiment in infant welfare; the city takes it over. It would have been hard to get municipal money to start such work. A going concern makes a quite different appeal.

In this case the private societies did another thing. They helped to create the public opinion which at least acquiesced in this extension of municipal activity and the increase of the health department budget. This educa-

tional service of nongovernmental agencies has been a powerful influence in the growth of the public health movement throughout this country.

Many people will see dangers in this transfer of work from private to public auspices. They will fear two things especially: The handicap of politics and the substitution of bureaucratic machinery for a more sympathetic human interest.

Both these possibilities may easily be exaggerated. There is a strong and growing sentiment against permitting such professional services as education, health and municipal engineering to be touched by partisan influences. Experience in other cities shows that under the right leadership municipal infant welfare and similar work can be done well and in a fine spirit. It is fortunate that in this transfer in Boston many of the nurses of the voluntary society are being taken over by the city so that there will be little break in personal relations.

It must be remembered too that this unit will house many private societies that will continue their activities. This coöperation between public and voluntary agencies is an impressive feature of the plan. Nowhere has there been a closer, more cordial relation than that established here in Boston. It has aroused interest and emulation in other cities. The way in which this team-play was brought about is instructive.

First of all the private societies got together with the public authorities. They formed the Boston Health League. Here was a sound and natural basis for coöperation. In the next place the City Health Commissioner was genuinely coöperative. He did not resent private societies; he welcomed them. They in turn loyally supported his administration. This relationship has been strengthened by an unusual but admirable arrangement by which the Director of the Municipal Health Unit has at the same time served as Executive Secretary of the Boston Health League.

Let us hope that this example of well organized effort will have suggestions for the health activities of the city government itself. Surely the School Board and the Health Department will find some way of working together more closely in carrying out a child health program. Then, too, it is hard to believe that the Health Department will indefinitely continue to maintain five different types of nurses under the auspices of three separate authorities when a unified staff could render more efficient and economical service.

In connection with this coöperative health unit under municipal auspices, it is important that the public should understand one thing clearly. A large part of the work will continue to be done by the voluntary societies. They will need generous support from private gifts. That system of community self-taxation which is an American distinction and source of pride will need to be maintained on a high level of generosity. This health unit is a city institution, but the city will not pay for all that is done here.

It should be made quite plain that the unit will put its emphasis on preventive effort. It will not be another dispensary. The work for mothers and infants, the nutrition service, the dental prophylaxis, all aim at anticipating and warding off diseases and avoiding defects. Educational campaigns in personal hygiene for adults will seek the same thing. Periodic health examinations will become in time an important feature here. The people of the district will find this a place where the whole effort will be to keep them well and vigorous.

This new health unit will have an influence upon the movement in the country. Each city has a contribution to make. The characteristic features of the Boston plan will be studied widely with interest, and will be gradually incorporated in the system which seems destined to play a vital part in the health movement of the United States and even of foreign countries. In Prague and Lyons health centers started under American Red Cross auspices are persisting and making progress. You may expect many visitors from home and abroad who will want to see the health units of Boston.

The institution which we dedicate today and others that are to follow are more than health centers. They are symbols of a community ideal which gives one glimpses at least of the city as a whole. Beneath differences in race, religion and economic status there are common interests and a common pride in citizenship. This unit proclaims that the health of each is a concern of all, that no group or section can live to itself alone; that Boston is in a very real sense a comradeship of people who seek to realize Aristotle's conception of a city as a place "founded that men may keep alive, continued that they may live well."

EDITORIAL SECTION

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THE NEW PRESIDENT OF THE AMERICAN PUBLIC HEALTH ASSOCIATION

Our new president, Dr. Henry F. Vaughan, is Commissioner of Health of the City of Detroit. He comes of a family of public health and medical men, his father being Dr. Victor C. Vaughan, for thirty years Dean of the Medical School of the University of Michigan. Three brothers received their degrees in medicine.

Henry F. Vaughan was born in Ann Arbor, Michigan, in 1889. He was educated at the University of Michigan, which institution conferred upon him the degrees of Bachelor of Science, Master of Science and Doctor of Public Health. He was graduated from the engineering school, having majored in civil engineering, and then took his master's degree in this field, after which he spent three additional years in the Graduate School and was the first candidate to receive the degree of Doctor of Public Health.

Eighteen months of his school life were spent abroad. Following his graduation from the university he spent a year with the Michigan State Department of Health, and then went to Detroit as sanitary engineer of the City Department of Health. Subsequently he held the positions of Epidemiologist, Assistant Health Commissioner and then Commissioner, this last appointment having been made in January, 1919.

Dr. Vaughan entered the service during the Great War, as a Captain in the Sanitary Corps. He served as Epidemiologist at Camp Upton, and later as a member of a special commission appointed by the Surgeon General for the purpose of investigating the causes and the means of controlling influenza and pneumonia. In this work he was associated with Major Russell L. Cecil, and under their direction special studies on the use of pneumococcus vaccine were carried on at Camps Upton and Wheeler.

Henry F. Vaughan D.P.H.

For ten years Dr. Vaughan has been on the faculty of the Detroit College of Medicine and Surgery in the Department of Public Health, and for two years a special lecturer in the Department of Public Health and Hygiene of the University of Michigan.

Occupied though his life has been in administrative duties, Dr. Vaughan has taken time to contribute writings on public health science. Together with Dr. George T. Palmer he has collaborated as a junior author of "Epidemiology and Public Health," the senior author of which is Dr. Victor C. Vaughan.

Henry F. Vaughan joined the American Public Health Association in 1913, and has taken an active part in advancing its interests. In 1916 he was elected

to the Governing Council. For three years he has served on the Executive Committee, and in 1922 was elected a vice-president. During the last two years he has held the responsible position of Chairman of the Editorial Committee of the JOURNAL, and in this capacity as principal editor he has given freely of his time and thought. To Dr. Vaughan, as Chairman of the Committee on Reorganization, our Association is greatly indebted for the revised constitution which was adopted at the Cleveland meeting in 1922.

Under the Vaughan regime, the Detroit Department of Health has grown in numbers and in efficiency and today represents an outstanding example of effective municipal health administration. Detroit is to be congratulated on the possession of a capable, well trained health commissioner and the American Public Health Association may look forward optimistically to the coming year with Dr. Vaughan in the presidential chair.

PUBLIC HEALTH WORK AND PROLONGATION OF LIFE

In 1911 *The City That Was,* written by Dr. Stephen Smith, the honored founder of the American Public Health Association, made the following statement:

"It has been estimated by careful writers on vital statistics that 17 in 1,000 living persons annually die from inevitable causes." In other words, a death rate of 17 per 1,000 was considered normal, so much so that the Registrar-General of England in his Twelfth Annual Report said: "Any deaths in a people exceeding 17 in 1,000 annually are unnatural deaths." In 1923 the death rate for the Registration Area of the United States was 12.3 per 1,000, while the estimated rate of 1924 is only 11.6 per 1,000.

How rapidly our ideas have changed! How quickly have the standards of a decade ago been proved to be too low! How clear the demonstration that life can be saved beyond what seemed possible only a few years ago!

Fiction and romance contain nothing more marvelous than our accomplishments in saving and prolonging life. The figures have often been given, but will bear repetition. The average length of life in this country has been increased from forty years to fifty-eight years in two generations, and the rate of increase has been more rapid in recent years. Four years were added between 1910 and 1920. The only disappointing feature about this increase in life expectancy is the fact that most of it has come through saving infants and children under five years of age. Up to 1910, and probably up to 1917, there was no gain in expectancy of life at 50, and for the 60–70 year period it was not so good as in ancient times. Reports during the past two or three years indicate that we are at least beginning to prolong life in the middle and later ages, whereas formerly the middle life death rate was increasing somewhat.

Infant welfare work, including pre-natal as well as post-natal care is still the most hopeful as well as the most practical and actually successful line of endeavor looking to the increase in longevity.

Among the other fields in which prevention has been markedly successful tuberculosis must take a high place. The death rate has been reduced one-half in twenty-five years, and the rate is steadily decreasing. Not only has the rate decreased, but the age at death of fatal cases has advanced six years, a factor of enormous economic significance. It seems likely that by 1930 the death rate from tuberculosis will have been reduced to a point below 50 per

100,000. Typhoid fever, which was for many years a scourge of our great cities, is now a vanishing disease, a reduction of approximately 75 per cent having taken place during the past twenty-five years.

The insect-borne diseases are a striking example of successful public health work. Yellow fever, the scourge of tropical America, and a frequent visitor to the temperate zones, is another vanishing disease, practically unknown in districts in which it was endemic for many years. Malaria gives ground always before the advance of agriculture and drainage. Bubonic plague will never again become pandemic, and outbreaks will be limited, as they have been in New Orleans, San Francisco, and other American ports, to a few cases.

This is in no sense a survey of the situation, merely a pointing out of a few of the most striking results achieved in the field of prevention during the last few years, in which every reader of this JOURNAL has participated more or less actively. We are not giving ancient history, rather are we recounting facts known to all of us, and some of which are so recent that we have scarcely realized them.

While epoch making discoveries have pointed the path to successful, practical accomplishment, education must be credited with a major share in the results. The public is becoming educated as to scientific facts and is demanding educated physicians and health officers. Many newspapers publish regularly reliable scientific information and are seeking more and more authentic sources for their articles.

"Public health is purchasable." Not only do we need the moral support of the public, but we need financial support as well. Already many great corporations have seen the advantages of preventive medicine, and have contributed to its maintenance in one way or another. Do not the facts warrant us in further appeal and in the belief that more liberal support will be forthcoming?

DR. ERNEST C. LEVY

The JOURNAL has already carried the news of Dr. Levy's resignation as Director of Public Welfare of Richmond. This resignation coming at the height of a successful career is a matter of serious concern to all public health workers. Dr. Levy's record is a most enviable one, and Richmond is to be congratulated on the advancement made under his guidance. His retirement from the direction of health work in Richmond is a matter of regret to all of those interested in public health, and the fact that it comes on account of a change in administration is added cause for concern. That a service of twenty years, marked by notable advances in the health of the city, improvements of milk and water supplies, and other things which made the city a better place to live in, should have been terminated through political exigencies, is a blow against better health work everywhere.

The policy of the JOURNAL is to avoid interference in local matters. In the present case, we do not express any opinion as to the whys and wherefores of Dr. Levy's retirement. We have always stood for permanent tenure of office for health officers so long as they were rendering efficient service. One of the things which has in the past kept good men from desiring to go into health work has been the uncertainty of office and the risk of retirement through no fault of their own and when efficient service was being rendered. Dr. Levy deserves well of his city, and has received from the oldest and most prominent health organization in the United States, of which this JOURNAL is the official organ, the highest honor it can

bestow—the presidency. This indicates what those outside of Richmond feel concerning Dr. Levy's service to that city. We still continue to hope that the time will come when changes of administration will not mean the dropping of men who have rendered notable service to their communities.

There are already indications that this hope is not in vain, for when we have a means of measuring the health work of a community in terms of group judgment, then the successful health officer can base his record on professional opinion rather than an individual opinion. When the score card being developed by the American Public Health Association has been perfected, the work of one man can be compared with that of another in definite terms. The mayor who replaces a good health officer always takes upon himself the responsibility of replacing not only the man but also his record.

Hitherto there has been no adequate measure by which the record of one man could be compared with that of another. The competent and incompetent alike have had, therefore, to base their claims for recognition largely on their own statements and those of their sympathetic friends. A score card will supplant this unjust system. It weighs the accomplishments of any health officer, almost as accurately as the scientist in his laboratory measures the candle power of a lamp and translates that weight into a simple figure easily comprehended by every citizen. There is much political capital in the fact that one health officer has raised the score of his city from 600 to 800 and another who may supplant him has allowed this score to lapse from 800 to 450.

This JOURNAL offers to Dr. Levy its congratulations for his accomplishments, and its good wishes for the future in whatever line of work he may engage.

SHALL THE UNITED STATES LEAD THE WORLD IN THE PREVALENCE OF SMALLPOX?

This JOURNAL has in the recent past published several editorials on the increase of smallpox in the United States, as well as in some other countries. At the risk of being wearisome, we must again call the attention of our readers, and especially those holding administrative offices, to the menace of this world-wide scourge.

Everyone is familiar with the fact that within the past few years hemorrhagic smallpox has been seen in a number of places in this country, and that the mortality has in some of these epidemics reached figures which, up to this time, have been considered things of the past. During 1923 only three countries of the world exceeded the United States in their smallpox rate, namely, Switzerland, Russia, and Greece, which had rates respectively of 55.0, 42.9, and 32.9, as compared with 27.1 for the United States. It will probably give a shock to those who have not followed statistics closely to learn that countries like South Africa, Egypt, Algeria, Finland, Hungary, and the Baltic Republics, have been better in this respect than our own country, these countries ranging from 3.9 down to 0.35 per 100,000, while the Scandinavian countries, Australia, and New Zealand report no cases at all.

Bad as our showing for 1923 was, the forecast for 1924 is that the United States will lead the world in the prevalence of smallpox. It has steadily declined in the other countries reported but reached its maximum in the United States in April; Montana, North Carolina, Washington, Oregon, and Minnesota leading in the number of cases. Montana shows 110 and Minnesota 68.9 per 100,000 of population. Even our good states show a rate approximating 50 per 100,000.

We have no intention of making things out worse than they are. We have in the past boasted rather than knocked, and it is our intention to continue this attitude, except where the facts demand plain speaking. It is, therefore, a pleasure, though akin to the pleasure which a bereaved family takes in hearing nice things said about the deceased, to point out that smallpox in the United States has shown a steady decrease, with the exception of a few years like 1920 and 1921, when the number of cases reported reached 102,787. Since the indications are that 1924 will show a larger number of cases than 1923, we feel that we would be failing in our duty to the health officers of our country if we did not report this fact and emphasize the necessity of intensive educational work and intensive vaccination and revaccination.

LIST OF MEMBERS

Proposed for election to the A.P.H.A., October 1 to October 31, inclusive
Names of New Members are set in Light Face Type.
Names of Sponsors are set in **Bold Face** Type.

ARKANSAS

Homer N. Calver, New York, N. Y.
James E. Johnson, M.D., Ft. Smith, Ark. District Health Officer.

CALIFORNIA

Homer N. Calver, New York, N. Y.
William H. Stabler, B.S., Los Angeles, Cal.

CANADA

Homer N. Calver, New York, N. Y.
Amedie Damers, M.D., Sherbrooke, Que., Canada. City Health Officer.

J. W. S. McCullough, M.D., Toronto, Can.
Gordon Anderson Bates, M.D., King N. W., Toronto, Can. Editor, Canadian Public Health Journal and Sec'y Canadian Social Hygiene Council.

Robert D. DeFries, M.D., Toronto, Ont.
Donald T. Fraser, B.A., M.B., D.P.H., Toronto, Can. Asst. Professor of Hygiene, University of Toronto.
Peter J. Moloney, M.D., Toronto, Ont. Department of Hygiene, University of Toronto.

CONNECTICUT

William H. Coon, M.D., Bridgeport, Conn.
Clifton C. Taylor, M.D., Bridgeport, Conn. Director of the Division of Child Hygiene.

Homer N. Calver, New York, N. Y.
Stella V. Houghmaster, Hartford, Conn. Principal, Outdoor School, Hartford, Conn.

William H. Park, M.D., New York, N. Y.
Raymond D. Fear, M.D., Dr.P.H., Stamford, Conn. Health Commissioner.

CUBA

Homer N. Calver, New York, N. Y.
Jose M. Cadenas, C.E., Havana, Cuba. Director of Sanitary Eng. Dept. and Secretary of Sanitation.

DELAWARE

Homer N. Calver, New York, N. Y.
Fred F. Armstrong, M.D., Wilmington, Del. Sec'y Board of Health, Wilmington.

DISTRICT OF COLUMBIA

Professor Aubrey H. Straus, Richmond, Va.
George F. Reddish, Ph.D., Washington, D. C. Bacteriologist, Bur. of Chemistry.

ILLINOIS

I. S. Falk, Ph.D., Chicago, Ill.
Lloyd Arnold, A.M., M.D., Chicago, Ill. Teacher of Public Health, Hygiene and Preventive Medicine, Loyola Univ. Med. School.

W. A. Evans, M.D., Chicago, Ill.
W. W. DeBerard, Chicago, Ill. Western Editor Engineering News-Record.

W. D. Bigelow, Ph.D., Washington, D. C.
C. Robert Moulton, Ph.D., Chicago, Ill. Director, Bureau of Nutrition, Inst. of American Meat Packers.

Harry G. Rand, M.D., Chicago, Ill.
John M. Murphy, M.D., Chicago, Ill. Chief, Bureau of Inspection, Chicago Health Dept.

Clara Jacobson, M.D., Chicago, Ill.
Florence A. Spencer, Chicago, Ill. Municipal Tuberculosis Nurse, Dept. of Health.

R. V. Brokaw, M.D., Springfield, Ill.
Lloyd H. Davis, Springfield, Ill. Commissioner of Public Health and Safety of City of Springfield, Ill.

INDIANA

Homer N. Calver, New York, N. Y.
Thurman B. Rice, A.M., M.D., Indianapolis, Ind. Director of Lab. Pathology of Indiana State Board of Health.

IOWA

Homer N. Calver, New York, N. Y.
Kathryne Gabriel, R.N., Dubuque, Iowa. Superintendent of Visiting Nurse Staff, Dubuque, Iowa.

KENTUCKY

Elizabeth G. Fox, R.N., Washington, D. C.
Margaret L. East, Louisville, Ky. Director of Bureau Public Health Nursing, Louisville, Ky.

LOUISIANA

Willis P. Butler, M.D., Shreveport, La.
Arthur G. Heath, M.D., Shreveport, La. President of Board of Health, and Health Officer.

MARYLAND

Percy D. Meader, M.D., Baltimore, Md.
William W. Ford, A.B., M.D., Baltimore, Md. Member Maryland State Dept. of Health.

MASSACHUSETTS

Emery R. Hayhurst, M.D., Columbus, Ohio.
Joseph C. Aub, A.B., M.D., Boston, Mass. Investigating Internal Secretions.
Annie Stone Minot, A.B., Ph.D., Boston, Mass. Research Work on Chemotherapy of Cancer.

Roger I. Lee, M.D., Boston, Mass.
Derric Choate Parmenter, A.B., M.D., Cambridge, Mass. Acting Head of Dept. of Hygiene, Harvard University, and Instructor in Industrial Medicine, Harvard School of Public Health.

Wm. G. Kirschbaum, New Bedford, Mass.
Francis M. Kennedy, D.D.S., New Bedford, Mass. Member Board of Health, New Bedford, Mass.

Homer N. Calver, New York, N. Y.
Charles Benjamin Fuller, M.D., Waltham, Mass. Director, Dept. of Public Welfare.

Emery R. Hayhurst, M.D., Columbus, Ohio.
Charles F. Horan, Watertown, Mass. Industrial Hygienist, Hood Rubber Co.

MEXICO

O. C. West, M.D., Los Mochis, Sin., Mexico.
Ignacio Alcaraz, M.D., Los Mochis, Sin., Mexico. Dist. Sanitary Officer, Mexican Public Health Service.

MICHIGAN

Professor John Sundwall, Ann Arbor, Michigan.
Gertrude Bilhuber, B.S., M.A., Ann Arbor, Michigan. Candidate for Dr.P.H.. University of Michigan.
Ezra G. Carter, M.Sc., Ann Arbor, Michigan. Teaching Public Health and Hygiene.
Dona Gayler, A.B., A.M., Ann Arbor, Michigan. Asst. Professor Hygiene and Physiology, Ind. State Normal School.
Ida M. Haskins, B.A., Ann Arbor, Michigan. Student at Univ. of Michigan.
Grace Song, M.D., Ann Arbor, Michigan.
Johanne D. Uhrenholdt, Ann Arbor, Michigan. Exec. Sec'y Washtenaw Co. Branch, Michigan Tuberculosis Association.

Don W. Gudakunst, M.D., Detroit, Michigan.
Donald Jerome Barnes, M.D., Detroit, Mich. Child Welfare.

Homer N. Calver, New York, N. Y.
Susanne Sanderson, M.D., Detroit, Michigan. Health Examinations for Y. W. C. A.
Emilia Gleason Sargent, A.B., R.N., Detroit, Michigan. Superintendent, Visiting Nurse Assn., Detroit.
Floyd R. Town, Jackson, Michigan. Health Officer.
Edward Franklin Eldridge, B.S., Lansing, Michigan. Chemist, Water Survey.
Sarah Louise Halsey, Presque Isle County, Michigan. Community Nurse, Rogers City.
Elsie C.Braun, Saginaw, Michigan. School Nurse, Health and Safety Dept., Saginaw.
Edith L. Vincent, R.N., Saginaw, Michigan. School Nurse, Dept. of Health, Saginaw.

Alvin H. Rockwell, M.D., Kalamazoo, Michigan.
George I. White, A.B., Kalamazoo, Mich. City Bacteriologist.

C. C. Young, Lansing, Michigan.
Harriett Baker, B.S., Lansing, Michigan. Bacteriologist.
Alice M. Exworthy, Lansing, Michigan. Bacteriologist.
Joseph L. Landau, M.D., Lansing, Michigan. Serologist, Michigan Dept. of Health.
Esther Shultis, Lansing, Michigan. Laboratory, Michigan Dept. of Health.

George H. Ramsey, M.D., Lansing, Michigan.
Iva M. Lickly, M.D., Lansing, Michigan. Research Worker, Michigan Dept. of Health.

Professor B. H. Bartlett, Ann Arbor, Michigan.
Carrie Webster, R.N., Mt. Clemens, Michigan. School Nurse, Mt. Clemens, Michigan.

MINNESOTA

F. E. Harrington, M.D., Minneapolis, Minn.
Cora T. Helgesen, Minneapolis, Minn. Supervising Nurse, Dept. of Hygiene, Board of Education, Minneapolis.
Elizabeth Sprague, Minneapolis, Minn. Head Nurse, Division Public Health, Minneapolis.

Alfred Aegis, Sc.B., D.D.S., New York, N. Y.
Philip R. Thomas, Minneapolis, Minn. Staff Phalen Hospital Crippled Children, St. Paul, Minn., Lecturer, Pediatrics Dept., Univ. of Minnesota.

MISSOURI

H. DeLamater, M.D., St. Joseph, Mo.
Irwin H. Baird, D.V.M., St. Joseph, Mo. Bacteriologist, Health Dept.

Max. C. Starkloff, M.D., St. Louis, Mo.
F. H. Moellenhoff, B.S., St. Louis, Mo. Asst. City Chemist, Milk Inspection.

NEW JERSEY

J. Randolph Chandler, Plainfield, N. J.
L. Van D. Chandler, Hackensack, N. J. Health Officer, Hackensack.

NEW MEXICO

George S. Luckett, M.D., Santa Fe, New Mexico.
Alexander F. Brown, M.D., Ft. Sumner, New Mexico. County Health Officer.

NEW YORK

Francis E. Fronczak, M.D., Buffalo, N. Y.
Theodore Victor Bauer, Ph.G., M.D., Buffalo, N. Y. Industrial Hygiene and Food and Drugs.

Homer N. Calver, New York, N. Y.
Ellen C. Babbitt, New York, N. Y. Editor, Child Health Magazine.
Lewis H. Carris, New York, N. Y. Managing Director, National Committee for the Prevention of Blindness.
Gertrude E. Hodgman, M.A., R.N., New York, N. Y. Educational Secretary, National Organization for Public Health Nursing.
Arthur Tomalin, New York, N. Y. Director of Publications, American Child Health Association.

Alfred Aegis, Sc.B., D.D.S., New York, N. Y.
Mary K. Baker, M.D., New York, N. Y. Dietitian, N. Y. Stomatological Clinics.
Esther Bernardine Hardisty, A.B., New York, N. Y. Statistician, N. Y. Stomatological Clinics.

Harold H. Mitchell, M.D., Fall River, Mass.
Emma Dolfinger, New York, N. Y. Director Health Education, American Child Health Association.

Wm. H. Marcussen, New York, N. Y.
Fred D. Holford, D.V.M., New York, N. Y. Chief Veterinarian, having control of dairy sanitation.

Emery R. Hayhurst, M.D., Columbus, Ohio.
May R. Mayers, A.B., A.M., M.D., New York, N. Y. Medical Inspector of Factories N. Y. State Department of Labor, Division of Industrial Hygiene.
Carroll M. Salls, Ph.D., New York, N. Y. Chemical Engineer, and Research in Div. Industrial Hygiene, N. Y. State Department of Labor.

L. D. Bristol, M.D., Olean, N. Y.
George J. Nelbach, New York, N. Y. Exec. Sec'y Committee on T. B. & P. H. State Charities Aid Assn.

Victor G. Heiser, M.D., New York, N. Y.
Winfield Carey Sweet, S.B., M.D., New York, N. Y. State Director, International Health Board, Director, Australian Hookworm Campaign.

Grace L. Anderson, R.N., New York, N. Y.
Mabelle S. Welsh, R.N., New York, N. Y. Associate Director, East Harlem Nursing and Health Demonstration.

OHIO

Roy F. Leslie, D.V.M., Cleveland, Ohio.
R. S. Cooley, M.D.V., Lakewood, Ohio. Assistant Health Officer.

Emery R. Hayhurst, M.D., Columbus, Ohio.
Rudolph C. Engel, M.D., Cleveland, Ohio. Industrial Medicine.

OKLAHOMA

Homer N. Calver, New York, N. Y.
Charles H. Spaulding, Oklahoma City, Okla. Filtration Engineer, Okla. City Water Dept.

PENNSYLVANIA

Homer N. Calver, New York, N. Y.
Frances M. Harrison, Philadelphia, Pa. Executive Secretary, Community Health Center, Philadelphia.

Richard P. Lienhardt D.V.M., Wayne, Pa. Milk Hygienist and Sanitary Officer to Boards of Health of Radnor, Upper Darby and East Landsdowne.

Emery R. Hayhurst, M.D., Columbus, Ohio.
William John McConnell, B.S., M.D., Pittsburgh, Pa. U. S. Public Health Service assigned to U. S. Bureau of Mines in charge of Research Work.
William P. Yant, B.S., Pittsburgh, Pa. Investigation of Indust ial Gases and Dusts—Publicity and Education.

SOUTH CAROLINA

B. S. Mustard, M.D., Murfreesboro, Tenn.
W. Atmar Smith, M.D., Charleston, S. C. Member Board of Health.

SOUTH DAKOTA

Clara E. Hayes, Waubay, S. D., and Park B. Jenkins, M.D., Waubay, S. D.
A. H. Wieters, B.S., Waubay, S. D. Director Div. of San. Eng., S. D. State Board of Health.

TEXAS

Emery R. Hayhurst, M.D., Columbus, Ohio.
Lewis Wm. Fetzer, Ph.D., M.D., Dallas, Texas. Chairman, Committee on Occupational Diseases, American Chemical Society.

WASHINGTON

Paul A. Turner, M.D., Seattle, Wash.
George N. McLoughlin, M.D., Seattle, Wash. Commissioner of Health.

Emery R. Hayhurst, M.D., Columbus, Ohio.
Lt. Col. Harry Vanderbilt Wurdemann, M.D., F.A.C.S., Sc.D., Seattle, Wash. U. S. Army.

WEST VIRGINIA

W. S. Rankin, M.D., Raleigh, N. C.
Wm. Hay McLain, Wheeling, W. Va. Health Commissioner.

WISCONSIN

John P. Koehler, M.D., Milwaukee, Wis.
Arch. J. Hood, M.D., Milwaukee, Wis. Health Officer.

ASSOCIATE MEMBERS

CALIFORNIA

Homer N. Calver, New York, N. Y.
Winifred Osborne Heard, A.B. Berkeley, Cal.
Victor D. McCarthy, El Segundo, Cal.

H. A. Harding, Ph.D., Detroit, Mich.
Wayne A. Hood, San Diego, Cal. Director of Public Health Dept., Pure Milk Dairy Co., San Diego, Cal.

CANADA

Homer N. Calver, New York, N. Y.
A. Ann Curtin, M.B., D.P.H., Toronto, Can.

DISTRICT OF COLUMBIA

Major Edgar E. Hume, M.D., U. S. Army, Washington, D. C.
Major Arthur N. Tasker, Washington, D. C. Instructor at the Army Medical School.

ILLINOIS

W. A. Evans, M.D., Chicago, Ill.
John M. Dodson, M.D., Chicago, Ill. Exec. Sec'y Bureau of Health and Public Instruction, American Medical Association.

IOWA

M. O. Maughan, B.S., M.A., Chicago, Ill.
Milton Hult, Davenport, Iowa.

Homer N. Calver, New York, N. Y.
George E. Hamilton, Des Moines, Iowa.

MICHIGAN

C. C. Slemons, M.D., Grand Rapids, Mich.
Joseph C. Rhea, Holland, Michigan.

Homer N. Calver, New York, N. Y.
Mary M. Cutler, M.D., Wayland, Mich. Medical Missionary.
Ernst Terhardt, Mt. Clemens, Michigan. Advocating the use of only inspected meat and poultry.

MISSOURI

Max C. Starkloff, M.D., St. Louis, Mo.
Charles F. Hatfield, St. Louis, Mo. Member of Mo. Tuberculosis Association, Missouri Society Social Hygiene.

OHIO

John E. Monger, M.D., Columbus, Ohio.
Charles A. Reed, Cincinnati, Ohio. Educational Theory Newspapers.

Homer N. Calver, New York, N. Y.
Hyman Kaplan, Cincinnati, Ohio. Superintendent of United Jewish Social Agencies.

NEW YORK

Homer N. Calver, New York, N. Y.
Parke F. Hanley, New York, N. Y. Director General Health Bureau.
Lawrence W. Luellen, New York, N. Y. Vice-President Individual Drinking Cup Co. President of Serv-a-Dish Co.

LIST OF A. P. H. A. FELLOWS

Following is a list of Fellows elected at the Detroit Annual Meeting, October, 1924.

PUBLIC HEALTH ADMINISTRATION

E. L. Bishop, M.D., Nashville, Tenn.
Louis Brownlow, Petersburg, Va.
John Joseph Middleton, M.B., D.P.H., M.R.S.I., Toronto, Canada.
Arthur L. Stone, M.D., Camden, N. J.

LABORATORY

J. G. Fitzgerald, M.D., F.R.S.C., Toronto, Canada.
Emerson Megrail, A.B., A.M., M.D., Cleveland, Ohio.
Friend Lee Mickle, Geneva, N. Y.
John X. Newman, B.S., Helena, Mont.
Henry J. Nichols, Major, M.D., Washington, D. C.

VITAL STATISTICS

Shirley Wilmott Wynne, M.D., D.P.H., New York City.

SANITARY ENGINEERING

Harrison P. Eddy, Boston, Mass.

INDUSTRIAL HYGIENE

Dan M. McDonald, M.D., Akron, Ohio.

FOODS AND DRUGS

Henry M. Loomis, S.B., Washington, D. C.

HEALTH, EDUCATION AND PUBLICITY

Edgar Alphonso Hines, M.D., Seneca, S. C.
Raymond Sears Patterson, B.Sc., New Brunswick, N. J.

PUBLIC HEALTH NURSING

Mary Laird, R.N., Rochester, N. Y.

UNAFFILIATED

Horace Cheney Swan, M.D., Hartford, Conn.
Clifford Charlock, Hilo, Hawaii.

LETTERS TO THE EDITOR

TO THE EDITOR:

Since the publication of my paper on anthrax in the November JOURNAL, I have received from the Pennsylvania Department of Labor a correction of the figures that were originally furnished to me and I feel that it would be well to publish a correction. In table III, on page 921, the following corrections should be made:

Under 1922, add 1 case under "wool industry," and make source not stated read 51 instead of 47, giving a total of 87.

Under 1923, make leather industry read 14, wool industry 2, hair and brush industry 5, and source not stated 30; total 64.

Under 1924, make leather industry 2, hair and brush industry 2, total 29.

This would make leather industry total 118, wool 12, source not stated 185, and grand total 438.

In table V, on page 923, the following corrections should be made:

Under Pa. 1922, 22 cases, 2 deaths; 1923, 19 cases, 2 deaths; 1924, 6 cases, 1 death; total for Pa. 90 cases, 14 deaths, per cent mortality 15. Under La. total deaths 12.

Change totals for years as follows:

1922, 86 cases, 20 deaths, 23 per cent fatal; 1923, 65 cases, 11 deaths, 17 per cent fatal; 1924, 26 cases, 7 deaths, 27 per cent fatal; total 427 cases, 109 deaths, 26 per cent fatal.

These changes in the tables make necessary some changes in the figures quoted in the paper, but would not change my conclusions.

Yours very sincerely,

HENRY FIELD SMYTH.

University of Pennsylvania,
November 17, 1924.

TO THE EDITOR:

In an article entitled "Is the Routine Prophylactic Use of Diphtheria Antitoxin Justified?" appearing in the October, 1924, number of the JOURNAL, Major A. Parker Hitchens comments on a previous paper by Doull and Sandidge[1] on the prophylactic use of diphtheria antitoxin and appears to differ radically from the opinions expressed by these writers. The article of Doull and Sandidge, however, to which Major Hitchens refers, deals exclusively with young family contacts of diphtheria cases. The writer agrees with Major Hitchens that the use of antitoxin as a prophylactic should be a limited one. Obviously, it should not be given to persons known to be immune; nor should it be given as is well known, to children with a history of asthma, chronic bronchitis or of any symptoms which should arouse the suspicion of hypersusceptibility to horse serum. It can never be regarded as a substitute for active immunization. It is not required to suppress epidemics among the general public, only occasionally in institutions and certainly not among collections of adults, for the most part naturally immune, such as troops in barracks.

On the other hand prophylactic diphtheria antitoxin is indicated, as Major Hitchens very properly observes, when "individuals of the most susceptible ages have probably been in dangerous contact with the infection." It is just this condition which actually exists among the families in which clinical cases of diphtheria occur. Taking the group of children of ten years and under with which the paper of Doull and Sandidge deals, it is shown that in Baltimore, under the average conditions of medical attendance in a large city and under the supervision of an active municipal health department, one in ten of such family contacts contracts diphtheria if prophylactic antitoxin be not given. If a younger age group be taken, as for example, in the large experience of Chapin in Providence, it is seen that in that city, among non-hospitalized cases of diphtheria, of 2,213 family contacts of six years of age and under, 361 became cases; an attack rate of 16.3 per cent. At the age of five years the attack rate was 22.1 per cent. These figures show that such children are in imminent danger of contracting diphtheria. Further it is proved by the statistics of others cited by Doull and Sandidge that a very large proportion of these secondary cases (approximately 60 per cent) is attacked between the second and the tenth day after the onset of the primary case. At the end of twenty-eight days approximately 90 per cent of the secondary cases have occurred. Prophylactic antitoxin, therefore, carries these young children over the period during which protection is most necessary.

Concerning Major Hitchens' criticism that the 2 per cent case fatality rate presumed by these writers has no validity, Doull and Sandidge were perhaps not exact in speaking of this as an assumption, as it is more of the

nature of an estimate, considered to be low, and based upon the probability that these children will receive antitoxin on the first or second day of their illness. That it is reasonable is indicated by the experience in Massachusetts in 1922, which has been reported by Kelley.[2] In this series of 1,040 secondary cases, 23 died, a case fatality of 2.2 per cent at all ages. Presumably the rate was higher in the younger age groups. As the case fatality rate for all reported cases in Massachusetts is reasonably low (6.6 per cent in 1921), it will be agreed that the secondary case fatality is not artificially raised by incomplete reporting of cases, since such cases are at least as likely to be reported as are primary cases.

The conditions which actually exist in this group of the civil population are those which must be considered in weighing the evidence for and against the prophylactic use of antitoxin, rather than the hypothetical considerations which Major Hitchens outlines.

The essential question is one of the comparative risk of death from diphtheria on the one hand and from antitoxin on the other. In the Baltimore series there is an excess attack rate of 8.8 per cent since prophylactic antitoxin failed to protect 1.2 per cent of the children to whom it was given. At this attack rate and at a case fatality rate of 2 per cent, there is an "excess" death risk from diphtheria for non-immunized family contacts of ten years and under of $.088 \times .02 = .00176$; that is, *one death for every 568 contacts.* In the most reliable statistical record of antitoxin injections, that of Park in New York, of 151,000 persons treated, two died; a death risk of one in approximately 75,000 treated. It may be noted that with a case fatality of one per cent or even one-half of one per cent, the evidence, *as actually observed at the present time,* is overwhelmingly in favor of the prophylactic use of diphtheria antitoxin in this particular group of children.

Very truly yours,

J. A. DOULL.

Johns Hopkins University, October 25, 1924.

REFERENCES

1. Doull, J. A. and Sandidge, R. P. *Public Health Reports,* February 15, 1924; pp. 283-294.
2. Kelley, Eugene R. *Public Health Bulletin No.* 139, January, 1924; pp. 155-161.

ASSOCIATION NEWS

STANDARDIZING THE MEMBERSHIP YEAR

An activity is now under way in the executive offices of the Association that is a distinct effort to lower administrative costs, and one in which members are invited to assist. It is the adjusting of the membership year of all members to coincide with the calendar year, in accordance with the vote of the Executive Board.

Under the old system, every month a certain number of bills were sent out to those members whose dues expired with that month. Under the present plan, all membership dues will expire on December 31, and all members will be billed at one time for their annual dues, which are, of course, payable in advance. This method will do away with a great deal of clerical work, thus saving the Association a considerable sum every year.

The work of adjusting all accounts to December 31, 1925, is now going forward. On December 26, 1924, a bill will be sent to every member, except those with whom special correspondence has been carried on, adjusting his account from the present month of expiration to December 31, 1925. When that bill is paid, no further payment will be required until the end of 1925, when the member will be billed for the calendar year 1926.

Members may assist in the Association's economy plans by remitting promptly the amount called for on their bills to be mailed December 26.

George Chandler Whipple died suddenly at his home in Cambridge, Mass., on Thanksgiving morning from angina pectoris. An appreciation of his very great service to public health will be found in the January issue of the JOURNAL.

AMENDMENTS TO THE CONSTITUTION AND BY-LAWS

Adopted at the Fifty-third Annual Meeting, Detroit, October 20-23, 1924.

In the September issue of the JOURNAL, three proposed amendments to the Constitution were published. These were presented to the Association and adopted at the Detroit Annual Meeting. One specifies that only a Fellow of the Association may represent an affiliated state public health society on the Governing Council. Another provides for the election of the Executive Secretary by the Executive Board instead of by the Governing Council, as has been done in the past. The Executive Secretary is no longer a member of the Executive Board. In accordance with the third amendment, his place is taken on the Board by the retiring President.

Several amendments to the By-laws were also adopted by the Governing Council. Under the old By-laws, "persons active in the service of public health" might be elected to active membership. That has been changed to read "persons professionally engaged in public health." The new By-laws state further that every applicant for active membership must have the endorsement of two Fellows of the Association.

While active membership is thus limited to professional workers in the United States, Canada, Mexico and Cuba, associate membership is open to all persons interested in public health wherever they may reside. These amendments illustrate the general trend of the Association toward placing public health work on a professional basis.

Before the Detroit Annual Meeting, no machinery was provided in the By-laws for definitely discontinuing membership for nonpayment of dues. In the past, all classes of members were considered not in good standing at the end of six months, if dues remained unpaid. Their JOURNALS were discontinued, and their membership records were removed from the active to the inactive file in the Association office. Nothing further was done, the understanding being when a member joined, that he was a member until he resigned. Now the By-laws have been amended so that a member of any class who allows his dues to remain unpaid for six months is regarded as not in good standing, and is not entitled to vote, hold office or enjoy membership privileges. At the end of eleven months he receives a notification from the Secretary by registered mail. A month thereafter, if he still has not paid his dues, his name is placed before the Executive Board, and it is then, by order of the Board, crossed off the membership roll. He may resume good standing in the Association at any time within the year by paying back dues and dues one year in advance. When his name has been ordered removed from the membership list by the Executive Board, however, he may be again admitted to membership only under the same conditions as a new member is admitted, and upon payment of all arrears.

RESOLUTIONS

Presented by the Committee on Resolutions, Dr. F. E. Harrington, Chairman, and adopted by the American Public Health Association at the Fifty-third Annual Meeting, Detroit, October 20-23, 1924.

APPRECIATION TO THE LOCAL COMMITTEE

1. RESOLVED, that the Governing Council express its appreciation to the Local Committee in Detroit for the successful and entertaining meeting of the Association made possible by the untiring efforts of the Local Committee.

IN MEMORIAM

2. WHEREAS, a divine Providence in its wisdom and justice has seen fit to remove from this earth and from our midst the following members of our Association:

Isaac Abrahams, M.D., Chicago, Ill.
Henry J. Barnes, Boston, Mass.
Sylvester J. Byrne, M.D., Brooklyn, N. Y.
Philip Castleman, M.D., Boston, Mass.
Marvin W. Glover, M.D., Washington, D. C.
Edward B. Joachim, M.D., Harrisburg, Pa.
Miss L. P. Loring, Prides Crossing, Mass.
Jose Lugo-Vino, M.D., San Juan, P. R.
H. B. Mastin, Chicago Heights, Ill.
E. L. Mueller, M.D., Wapakoneta, Ohio.

Frank E. Platt, Scranton, Pa.
T. Mitchell Prudden, M.D., New York City.
Elgar Reed, M.D., Chino, Calif.
Harold H. Roberts, Maywood, Ill.
Edgar Richards, Newport, R. I.
Frederick Torrance, M.D., Ottawa, Ontario.
Miss Nella M. Woods, Kingwood, W. Va.
Wm. L. Young, Springfield, Mass.
James M. Jackson, M.D., Miami, Fla.
William De Lano, M.D., Grand Rapids, Mich.

AND WHEREAS, by death we have been deprived of the companionship, advice and counsel of these able and capable members in the Association, therefore be it

RESOLVED, that we express our sorrow at the loss that we as members, and collectively as the Association, have sustained. Be it further

RESOLVED, that this resolution be spread upon the minutes of the Fifty-Third Annual Meeting of the American Public Health Association, and that a copy of this resolution be sent to the bereaved families of the deceased members.

PASTEURIZATION OF MILK

3. WHEREAS, pasteurization of milk has proved of inestimable value in the prevention of tuberculosis of children as well as other diseases; and

WHEREAS, it is at present the most practicable and rapidly carried out measure for the safeguarding of the milk supply; be it

RESOLVED, that this Association go on record as endorsing the pasteurization of milk supplies for human consumption.

CARBON MONOXIDE

4. WHEREAS, carbon monoxide is one of the most widespread poisons in connection with human life and activities, and

WHEREAS, there has been a great increase in America in recent years in deaths and partial asphyxiations from this gas, as well as a considerable extension in our knowledge regarding this form of poisoning and methods of preventing and controlling the same, be it

RESOLVED, that all school courses and textbooks upon the general subjects of physiology, hygiene, sanitation and home economics shall contain a presentation of the hazards to health and life, methods of rescue and resuscitation from carbon monoxide poisoning, and, furthermore, be it

RESOLVED, that all general textbooks and instructions, printed or otherwise, upon the use and care of gas fired appliances, automotives and other internal combustion engines, furnaces, stoves and carbonaceous fuel utilizing devices and mechanisms in general shall contain a presentation of the hazards to health and life, methods of rescue and resuscitation from carbon monoxide poisoning.

LYE AND CAUSTIC SUBSTANCES

5. WHEREAS, the distribution of concentrated lye and other dangerous caustic substances in containers intended for household use frequently give rise to disabling and even fatal accidents, because of ignorance as to the dangerous character of the contents and of methods of treatment, and

WHEREAS, properly affixed poison labels with instructions as to emergency treatment would tend to diminish the frequency of such accidents and to mitigate the severity of their end-results, and

WHEREAS, public spirited manufacturers and packers of concentrated lye and other dangerous caustic substances are deterred from affixing adequate cautionary labels, or if they do so are handicapped, because of the unwillingness of competitors to use similar labels, be it

RESOLVED, that in the judgment of the American Public Health Association, in meeting assembled, federal and state laws should be enacted to require poison labels, containing suitable instructions and emergency treatment, to be affixed to all packages of concentrated lye and other dangerous caustic substances intended for household use; and be it

RESOLVED, that copies of this resolution be sent to the Secretary of State of Cuba, Canada, Mexico, and the United States, and to the Secretary of State or corresponding official of each of the states or provinces included in the aforenamed countries.

THE JOURNAL

As the members know, for several years past the JOURNAL has been edited by a subcommittee of the Executive Board, with Dr. Henry F. Vaughan as Chairman. It was taken over by this committee when the Association was in financial difficulties. We are now on a sound financial basis; Dr. Vaughan has resigned as Chairman of this committee, and has been elected President of the Association. Mr. Homer N. Calver has been elected Managing Editor of the JOURNAL and an Editorial Committee consisting of the following has been appointed: L. I. Harris, M.D., E. R. Hayhurst, M.D., Abel Wolman, C. C. Young, James A. Tobey, L. I. Dublin, Ph.D., Taliaferro Clark, M.D., E. G. Routzahn, C.-E. A. Winslow, Dr.P.H., Arthur Tomalin, with M. P. Ravenel, M.D., as Chairman. The members of the committee will continue to contribute abstracts and running comments, while Dr. Ravenel will continue to have special charge of the Editorial Department of the JOURNAL.

The Editor desires once more to ask the active coöperation of the members of the Association. The JOURNAL belongs to the Association, and it is our earnest desire that it shall serve not only to keep the members in touch with what is going on in the field of public health and in the Association, but to serve also as an outlet or medium of expression for individual members. While it is only human to desire and to like praise for our spiritual benefit, we desire and request criticisms and knocks, provided they are constructive; but all communications will receive courteous and prompt attention. Our consistent endeavor will be to improve the JOURNAL not only in substance, but in appearance. Let the members one and all give us their assistance and advice and make the JOURNAL a real medium of communication between the members during the large part of the year in which meetings are not in progress.

EMPLOYMENT BUREAU

POSITION WANTED

Positions wanted announcements of 40 to 50 words will be carried for individuals at a charge of $2.00 per insertion. Copy should be received at the New York office by the 8th of the month preceding publication.

Pathologist and Bacteriologist with Ph.D. degree desires position. Graduate, well known eastern university. Twelve years' experience, qualified for responsible position in public health work, teaching or laboratory. Am interested only in position important enough to automatically offer good salary. Address 324, care of this JOURNAL, New York address.

Wanted: Public health work, preferably state or city child hygiene. Middle aged man, M.D., with seven years' general public health and special child hygiene experience. Salary, less than four thousand not considered. Now employed, but available on reasonable notice. Full information and references gladly furnished. Address 327, care of this JOURNAL, New York address.

Technician desires a position. Experience in milk analysis and assisting serologist, no Wassermann test. During the war was located at Plattsburgh as technician. At present in a New York laboratory, but will go anywhere. No objection to working with private physician. Address 328, care of this JOURNAL, New York address.

Wanted: Position with official or unofficial organization as administrator or field worker. Graduate sanitary engineer, age 34, with ten years experience in health work as both organizer and administrator. Ability to write and lecture. Excellent references can be furnished. Salary desired, $4,000. Address 329, care of this JOURNAL, New York address.

Wanted: Part-time or full-time position as instructor in sanitation, epidemiology, vital statistics, or public health administration in a school of recognized standing. Graduate, sanitarian from Massachusetts Institute of Technology with long period of practical experience. Address 330, care of this JOURNAL, New York address.

Public Health **Administrator:** Thoroughly experienced and seasoned health administrator and officer in all departments; M.D. degree and public health certificates. Will entertain an offer to organize or administer full-time public health activities. At present located and associated with a national organization in administrative capacity. Salary, $4,000 with maintenance. Change desired only on account of severe climatic conditions. Address 331, Administrator, care of this JOURNAL, New York address.

Position desired in public health or milk plant laboratory by young woman. University graduate, major in bacteriology. Two years' experience. West of Mississippi preferred. Address 333, care of this JOURNAL, New York address.

Young man, 27, desires position in public health work. Recent graduate, B.S., with training in bacteriology, foods and nutrition and dairy industry. Has had some laboratory experience in dairy industry, but wishes to get more directly into public health work. Address 334, care of this JOURNAL, New York address.

Wanted: Position in a southern city as milk and meat or food and dairy inspector, by a graduate veterinary with several years' experience in municipal food and dairy work. Address 326, care of this JOURNAL, New York address.

HELP WANTED

Help wanted announcements will be carried free in this column until further notice. Copy goes to the printer on the 8th of each month for publication on the 20th. Mail to New York office as early as possible.
In answering keyed advertisements, please mail replies separately to business office in New York City. In replying give age, professional training, salary requirement, previous positions held and three or more references.

Wanted: Health officer for medium sized city of middle west. Health department is well organized and includes all public health work of the city. Local political conditions highly favorable to development of an ideal health department. Position open January 1. Salary, $4,000 to $5,000. Address 586, care of this JOURNAL, New York address.

Wanted: Two physicians with thorough knowledge of diagnosis and treatment of tuberculosis, experienced in pneumothorax procedure. Salary $3,500–$5,000, depending on qualifications. Location in New York State. Must be American citizen. Address 587, care of this JOURNAL, New York address.

Wanted: A national public health organization has an unusual opportunity to offer an unusual man. Favorable consideration will be given to a man under thirty, preferably unmarried, who has had a sound training in public health and some experience. Include in letter of application complete information of work done, samples of published or unpublished material, a recent photograph and such other information as will help the prospective employer to judge of the personal and technical qualifications of the applicant. Address 584, care of this JOURNAL, New York address.

UNITED STATES CIVIL SERVICE EXAMINATION

Industrial Investigator.—Receipt of applications for industrial investigator will close December 16. The examination is to fill vacancies in the Bureau of Labor Statistics, Department of Labor, at an entrance salary of $2,400 a year. Advancement in pay may be made without change in assignment up to $3,000 a year.

Competitors will be rated on their education and experience, and publications or reports to be filed with the application.

Full information and application blanks may be obtained from the United States Civil Service Commission, Washington, D. C., or the secretary of the board of United States civil service examiners at the post office or custom house in any city.

Wanted: Interne, Communicable Disease Hospital, Baltimore, Maryland. Six months service, Forty Dollars per month, with maintenance. Address 581, care of this JOURNAL, New York address.

BOOKS AND REPORTS REVIEWED

Military Meat and Dairy Hygiene.—*Prepared under the Direction of the Surgeon General of the United States Army, Compiled by Captain Horace S. Eakins, V.C., Medical Department, U. S. Army. Baltimore: Williams & Wilkins.* 1924. Cloth. Price, $6.50.

This book which has been prepared under the direction of Surgeon General of the Army, can be thoroughly recommended. Beginning with the problems of administration, it takes us through the inspection of establishments, ante-mortem and post-mortem inspection of food animals, methods of slaughter, preparation, curing, preservation, and canning of meats and meat products. There is a good chapter on poultry, its commercial production and veterinary examination. Another chapter is devoted to eggs, and still another to fish and sea foods, including their preparation, inspection and canning. This chapter contains an interesting section on the poisonous fish, written by Mr. Taylor, of the Bureau of Fisheries. Something over 100 pages is given to the production and preparation of milk and milk products, in which are included the bacteriological and chemical standards adopted by the American Association of Medical Milk Commissions. Directions are given for the detection of the common preservatives and adulterants. Methods of drying milk and the use of both condensed and dried milks are well considered. A considerable section is given to cheese.

The book is abundantly and well illustrated. It is a pleasure to read a book which is so well arranged and well written and which contains such a wealth of useful information. It can be thoroughly commended from every standpoint, and should find a place, not only in the libraries of those connected with our army, but of all interested in the proper care of the class of foods considered.

The author modestly calls it a compilation. He has unquestionably drawn from authoritative sources, but deserves full credit for the excellent arrangement of his topics and for the very clear presentation of them. The printing and binding of the book is characteristic of the excellent work for which its publishers are known.

The Evolution of Man.—*Essays by G. Elliott Smith, M.A., M.D., Litt.D., D.Sc., F.R.C.P., F.R.S. London and New York: Humphrey Milford, Oxford University Press.* 1924. Cloth. $2.85.

Anything from the pen of Professor Elliott Smith is well worth our attention. He has assembled three notable addresses in one volume and added a preface and a foreword, both of which assist greatly in following his argument. He describes his method as an historical inquiry into the circumstances of man's origin and descent, considering this method as necessary to the proper understanding of the development of his distinctive powers of intelligence. Two illuminating charts express graphically our present state of knowledge of the grouping and degrees of kinship of the various genera and species of the human family, and indicate the position of the human family in the order of primates. The foreword is especially valuable to those not versed in such studies, as it gives in a clear, easy, understandable manner the results which would otherwise have to be obtained from much study and wide reading.

The presentation of the emergence of human intelligence is particularly lucid and interesting. The author stresses the importance of the persistence of primitive traits and shows clearly that early specialization has proved disastrous. The replacement of smell by sight as the dominant sense and the evolution of stereoscopic vision are particularly interesting. The germs of civilization were planted in man when his attention had become fixed upon specific problems. He was brought to deal with these in an experimental manner and, by coöperation with others, to solve them after a certain fashion, and to hand on his knowledge to those who came after him. Every research opens up new lines of investigation and new trains of thought. When once this method of groping into the unknown was inaugurated, the human mind entered into a new world which was always expanding. Man's life was at first closely analogous to that of the anthropoid apes, and his mental equipment has grown to its present condition through knowledge derived from members of

the community in which he has lived, to which have been added such facts as he could pick up from his own experience. War has not resulted from innate combativeness, but rather from the necessity of obtaining food.

While making no pretense to be a complete treatise on the subject of evolution, these essays give an excellent survey of the field and are so clearly written that they can be followed by any educated person. It is hard to understand how anyone can read this book without being convinced of the fundamental truths of evolution. Since the proper study of mankind is man, Professor Smith's addresses can be commended to the careful consideration of all of those who are interested in the origin and development of their kind. A vast amount of knowledge in readable and understandable language is put into the minimum amount of space.

The printing and binding of the book are all that could be desired.

Studies in **Human Biology.**—*By Raymond Pearl, Professor of Biometry and Vital Statistics in the School of Hygiene and Public Health, and of Biology in the Medical School, The Johns Hopkins University. Baltimore: Williams & Wilkins Company,* 1924. Cloth, Price, $8.00.

The volume before us is difficult to review for the reason that it is a collection of essays, most of which have been published elsewhere. It is stated in the preface that the only claim for unity which can be made is that which inheres in the point of view of the writer.

The paper cover carries an extensive advertisement, giving twelve different types of students to whom the book will appeal, and not satisfied with including pretty nearly every profession in the world, ends up by saying that every educated reader who desires to know something about man will find the book of interest. We are not disposed to quarrel with these statements, as we believe that they contain a certain amount of truth, but it is rather hard to make a man who is interested in only one of the topics mentioned buy a book which contains a great amount of abstruse mathematics, which few public health officers can understand. There is some balm, however, in the fact that every essay ends up with a set of conclusions, so that one may get the gist of the matter, albeit the tiresome calculations leading to the end may be as Greek or Choctaw to him.

The author writes with optimism about things concerning which he is pessimistic. He is evidently a Malthusian, and it is hard to understand how any student along these lines can do anything else than agree substantially with the doctrines of that great man, although for many years they were scouted. He regards future wars as being inevitable. Since there will be "an ever-increasing pressure of population on the means of subsistence," there is not room enough for all, and the fittest must survive. Just who will these be? Will the meek inherit the earth?

It will disturb our New England friends—provided they can be persuaded to believe it—that the native stock of New England is passing away with rapidity. Everyone will feel safer over the statement that America is a true melting pot in which, at a higher temperature and at greater efficiency than most of us have realized, amalgamation has taken place, the resulting product being a real "American" people with characteristics containing much to admire from every standpoint. Indeed the ultimate result will be a people equal to any on the face of the earth.

Some interesting experiments in immigration are proposed, namely the absolute prohibition of immigration for all people for a period of ten to twenty years. This would evidently act somewhat in the way of an intermittent filter. Our good results so far are not due to any particular wisdom or judgment on our part, but to our size and, therefore, our absorptive powers. The period of rest as suggested would allow this assimilation to be complete and, to use further the simile of the filter, the effluent would be purified and not show signs of clogging and deficiency of aeration.

From what we have said, we may well add another class to those listed on the paper cover, namely the politicians or statesmen, in whatever class we may be inclined to record those who have charge of public affairs.

There is certainly food for thought in every page of this book. Even if much of it is out of the reach of the average reader, there is still valuable material for all who are interested in public health problems.

The make-up and printing of this book is a good example of the excellent work so characteristic of the publishers.

Evolution.—*By Vernon Kellogg. New York: D. Appleton and Co.* xii+291 pp. Price, $1.75.

This is an authoritative book for the layman who wishes a nontechnical, accurate statement of the present day status of our knowledge of the process of organic evolution and of human and societal evolution. It is of interest to all who are concerned in the welfare of human society present and future. The author discusses the possibility of man's control in a measure of his own evolutionary fate. He finds grounds for hope in the increasing numbers of those concerned about eugenics, in the tendency to temper altruism with intelligence, in the substantial advance in guarding public health, in the growing opposition to war, in the attempts to protect American people from ill-advised race mixtures resulting from indiscriminate immigration, in the protection from industrial overstrain, in the inquiry into birth control, in the better understanding and measurement of intelligence, and in the general advance in education in biology. Education and wise legislation may so direct societal evolution as to be helpful to our racial evolution. The problems before the American people which call for wise biological action are immigration, the negro problem, the selective birth rate, and growth of population and food supply, the control of defectives, and the conservation of human life by protection from accident and disease, by adequate housing and food, and the prevention of harrowing class struggles.

Race Hygiene and Heredity.—*By Herman W. Siemens, M.D. Translated and Edited by Lewellys F. Barker, M.D. New York: D. Appleton & Company.* 1924. Cloth. *Price* $2.00.

As stated in the preface to the English translation, this work should be of special interest in this country since our population is made up of a great variety of racial stocks. The first part of the book is a clear exposition of the fundamental principles of inheritance. It is pointed out that the capable stocks are not being reproduced as rapidly, and in as great numbers, as the poorer stocks. The first task before us is to arrest the dying out of the socially higher classes which is going on at a rapid rate, and prevent the unwholesome selection which threatens the extinction of the best hereditary stocks.

The author believes that the preservation of our race depends upon the widespread knowledge of the known facts concerning race hygiene. Biology deserves a place in all of our schools and universities, and there should be professionships for race hygiene, with courses including the teaching of the biology of inheritance and of selection. Unless this is soon done, we cannot hope to overcome the introduction of destructive economic policies and moral views which now threaten us.

There is a good bibliography of English and German authors, and a glossary which enables the untrained reader to understand technical biological terms. The book is well printed and put together.

PUBLIC HEALTH NOTES

GENERAL

A Valuable Consultant Service.—Miss Sally Lucas Jean has recently established a Consultant Service to professional and business groups in the development of their health and educational programs. Miss Jean is well known throughout America and abroad for the important part she has played in the organization and development of the health education movement. Her knowledge of the needs of the country, the attitude of the people, and her recognized ability in the development of programs involving popular approval and support, place a very high value upon her consulting service. It seems certain that Miss Jean will make an important contribution to the public health through her service to both national and local associations, official and unofficial social agencies, and various business groups. The address of this service is 200 Fifth Avenue, Room 262, New York City. The following people have volunteered their services to Miss Jean as a group of advisors upon whom she may call at any time: Julia Wade Abbott, E. V. McCollum, Ph.D., William Palmer Lucas, M.D., John A. Sundwall, M.D., Clair E. Turner, C.P.H., C.-E. A. Winslow, Dr.P.H., Thomas D. Wood, M.D.

Fourth Child Health Demonstration.—After carefully weighing the applications from more than 30 cities and counties in the 11 Pacific Coast and Rocky Mountain states which made application, the committee selected Marion County, Oregon, as the field of the Fourth Commonwealth Fund Child Health Demonstration. The population of Marion County is estimated at 55,000, of which 90 per cent are American born. It is essentially rural, Salem, the state capital, having a population of 25,000. The migratory labor population common to the far west, incident to the varied crops and industries, presents perplexing child health problems. In this county the migratory group is estimated at from 3,000 to 10,000.

The committee believes that the well organized and expanding Extension Division of the University of Oregon, the Oregon Agricultural College and Oregon normal schools assure the effective spread of whatever sound standards, methods and procedure the Demonstration may develop. A completely equipped house for headquarters is offered by the Salem School Board, and maintenance and upkeep are assured by the civic clubs of the city. The citizens of the county have pledged the early establishment of a full-time county health unit, and it will be their aim to increase the appropriations for child health each year until at the end of five years they will have taken over the responsibility for the complete program.

Earlier demonstrations in the Commonwealth Fund program are under way in Fargo, N. D., Athens, Ga., and Rutherford County, Tenn. The work in the new field will begin early in 1925. The purpose is to free the babies and children of today as far as possible from physical and mental handicaps, but to promote wholesome and constructive attitudes toward an efficient, far-visioned public health program and toward its intelligent support. In Marion County the program will especially consider western needs and western conditions.

New Red Cross Health Service.—Announcement has been made of the appointment of Dr. William R. Redden, as assistant to Vice-Chairman Fieser of the National A. R. C. In his new position Dr. Redden will represent the Vice-Chairman in questions relating to Red Cross health service as well as general administrative matters referred to him. He will be in liaison with the American Medical Association as well as other medical and health groups, and help develop the Red Cross health work and health education program. He will also maintain medical liaison with the offices of the Surgeons General of the Army, Navy and U. S. Public Health Service, and will assist the Vice-Chairman to carry out the recommendations of the Chairman's Health Advisory Committee.

His training and experience, both as a teacher and medical man, fit him admirably for the work which he will undertake. Dr. Redden has been First Aid Field Representative on the First Aid Instruction Car. He is a graduate of Bates College, 1906. He has had a wide teaching experience and was for two and a half years in the U. S. Navy Medical Corps, stationed principally at Chelsea, Mass., and was cited in Navy orders for developing a pneumonia serum. Since leaving

the Navy he has been doing research work on pneumonia and general consultation service.—*The Red Cross Courier*, Nov. 1, 1924.

An Opportunity for Service.—An invitation is given to all secondary schools of the United States—junior, senior and four-year high schools—both private and public by the American Child Health Association to make a study of your school health program during the second half of the present school year and to submit it for comparison with the health programs of other secondary schools. The reason for such an undertaking is the very widespread interest in health education work in high schools as evidenced by frequent requests for information from teachers and principals.

The studies will be judged by a committee selected from prominent educators and professional workers in the health field. We propose, through a published report, to make available the conspicuously effective programs as selected by this committee, due credit being given for each contribution used.

The general points determining the judgments may be roughly indicated by the following statement of the factors considered important in a health program, such as permanency, scope, workability, and community and civic significance. In other words, the value of a health program involves consideration of some of the following points:

1. Its relation to the rest of the school program.
2. The degree to which it is temporary or permanent in the general program of the school.
3. The percentage of teachers and pupils in the school included in or affected by it.
4. The practical results which may be measured objectively as compared with theoretical aims and required knowledge.
5. The degree to which the program in the school extends into the homes and communities.
6. The relationship between the amount of money expended, facilities provided and results obtained. The spirit, purpose and results of the program are of greater significance than the quantity of expenditure.
7. The extent to which this program in the schools would affect the later lives of the pupils as indicated by the program submitted.

One thousand dollars will be evenly divided among the three schools contributing the three leading programs. This sum of money is offered for the furtherance of education and is to be used by the schools to promote health projects. Each of the three leading schools will receive $333.

If you are interested and would like to receive the details and definite outline of procedure, write at once to the Secretary of the High School Project, American Child Health Association, 370 Seventh Avenue, New York City.

This first indication of interest implies no responsibility on your part. If after receiving the detailed outline you wish to enroll formally, your application must reach us by January 10, 1925.—A. C. H. A.

STATE

Illinois

C. W. Conrad, superintendent of public schools in Anna, announced that a diphtheria eradication campaign has been undertaken in the schools. The Schick test is given by local physicians, the school authorities stimulating favorable sentiment and keeping records of the results. Children who show susceptibility are urged to go to their family physician and be immunized by taking toxin-antitoxin. Mr. Conrad reports excellent coöperation on the part of both the parents and physicians.

Dr. H. L. Wright has resigned as health officer of Berwyn to accept the position of county health officer in Cook county. He is succeeded in Berwyn by Dr. Preston E. Wright, a brother.

A disagreeable experience with smallpox is in prospect during the winter and spring months of 1925. With smallpox more prevalent than has been the case in years, with a health department field force so limited as to make it almost helpless in the face of a general epidemic and with a heavy unvaccinated population, the outlook is somewhat discouraging. Besides this there is an organized effort to prevent vaccination in the state. Local health authorities should do all possible to get their population protected through vaccination.

Typhoid fever cases in the state this year have been the lowest on record. With the usual typhoid fever season about over, prospects are bright for the most favorable showing ever made in respect to that disease.

PUBLIC HEALTH LABORATORY NOTES

C. C. YOUNG

The Protective Power of Normal Human Serum Against Pneumococcus Infection.—The protective power for mice of the serum of normal individuals was tested against injection with highly virulent strains of pneumococci of the three fixed types. The author demonstrated definite protective power (from 10 or more M.L.D. of culture) in 4 of 22 sera tested against pneumococcus Type I; in 8 of 18 sera tested against pneumococcus Type II; and in 11 of 23 sera tested against pneumococcus Type III. He found that the protective power against one type of pneumococcus was not necessarily associated with protective power against other types. Of 15 sera tested against all three fixed types, none protected definitely against all three; five sera protected against two of the three types; and eleven against one or more of the three types. Sera which protected against Type II pneumococci usually but not invariably protected also against an atypical II A strain, and vice versa. Further observations are recommended to determine the significance of this protective power, for it seems probable that it is a manifestation of one of the important defensive mechanisms in natural immunity.—P. W. Clough, *Johns Hopkins Hosp. Bulletin*, 35:330 (Oct.), 1924.

Agar Filtration Method.—All laboratory workers are familiar with the difficulties accompanying the usual method of filtering agar through cotton in a funnel. In order to avoid these difficulties, some laboratories, notably those of New York State, use a filtration method based on the principle of suction. Such a method is employed in the Michigan Department of Health Laboratories.

The empty, covered bottles are inverted in the container of melted agar medium, the container placed in a steam sterilizer (Arnold) and, in the case of 1.5 or 2 per cent agar, left for thirty minutes at a temperature of 98° to 100° C. The container is then removed from the Arnold and the contents left undisturbed at room temperature for filtration to take place. The filtration of the agar into the bottles is usually complete within five to ten minutes after removal from the Arnold. In the filtration of a medium of higher agar content, such as 3 per cent, the heating period is extended to one hour, after which the Arnold is turned off. The medium is allowed to remain in the sterilizer for filtration, since cooling too quickly may cause partial solidification due to the high agar content before filtration is complete. It should be remembered that the vacuum in the filtration bottles is never complete and the bottles are usually found to be about two-thirds full after filtration.—P. L. Kendrick, Mich. Dept. of Health.

Photograph by L. C. H. Michigan Department of Health

The Employment of Arsphenamine and Its Derivatives in the Modern Treatment of Syphilis.—Raiziss et al., in the *Journal of Clinical Medicine*, recognize that on the question of choice between arsphenamine and one of its derivatives there is a difference of opinion. The chief determining factor should be the chemotherapeutic index (relation of maximum tolerated dose to minimum therapeutic dose) of the particular drug employed and the manner in which this drug is clinically tolerated. On this basis, in our estimation, neoarsphenamine is to be preferred. A single dose of 0.9 gm. neoarsphenamine is generally considered the therapeutic equivalent of 0.6 gm. of arsphenamine—the latter, however, being two to three times as toxic as the former. Arsphenamine contains about

30 per cent arsenic while neoarsphenamine contains about 20 per cent. All things being equal, we believe that therapeutic agents with decreased arsenical contents are more desirable. Although comparisons of the drug effects, in parallel stages of syphilis over a given period, have indicated that neoarsphenamine necessitates generally a third again as many treatments as arsphenamine, there is this compensation: there is much less likelihood of toxic disturbance, and treatment in many cases may be prolonged—a thing admitting of more satisfactory end-results. Again, the chemotherapeutic index of neoarsphenamine—due to improvement in its manufacture—has been increasing and is considerably higher than that of arsphenamine. Thus, because the newer arsenical is less toxic and therefore less likely to produce reactions, and also because the technic of its administration is simpler, physicians throughout the world are using more neoarsphenamine than arsphenamine. There are, however, some prominent syphilologists who believe arsphenamine to be more efficient than neoarsphenamine and therefore prefer to employ it, in spite of its admittedly higher toxicity. The advantage of neoarsphenamine may therefore be summed up as follows:

1. It is a neutral compound possessing about the same hydrogen-ion concentration as the blood. Its injection into the blood stream, therefore, causes less biochemical disturbance, both in the blood and tissues, than the strongly alkaline solution of arsphenamine, the hydrogen-ion concentration of which is different from that of the blood.

2. Neoarsphenamine in the ordinary concentrations employed is not hemolytic, except in very dilute solutions or in extremely concentrated solutions, while arsphenamine is hemolytic in virtually all concentrations in which it is used.

3. Neoarsphenamine is more rapidly soluble and may be used in much greater concentration; consequently, the solution may be given in a glass syringe. Arsphenamine, on the other hand, is given from a burette by the gravity method. The preparation, too, and the technic are much less elaborate in neoarsphenamine and the possibility of error, therefore, is less.

4. Neoarsphenamine, experience demonstrates, is tolerated by the patient much better than arsphenamine. Reactions are both rarer and milder, when they do occur, and, consequently, interruption of treatment is less likely.

5. Neoarsphenamine is almost invariably preferred by the patient, since there is less pain, less trauma (finer needle), risk, reaction and time consumed.

The newer methods of treating syphilis have been employed but little more than a decade. Sufficient time has not elapsed for the development of a crystallized therapeutic program acceptable to the great majority of syphilographers. The selection of the remedy, the dosage, the frequency of administration, the number of treatments in a course, the number of courses, etc., are all matters determined by the physician for himself. Certain general propositions, however, have been suggested by those who have had the widest experience in the treatment of syphilis. —G. W. Raiziss et al., *Jr. Clin. Med.*, 31:369 and 445 (June and July), 1924. Author's abstract.

Bacteriology from the Point of View of the German Patent Right.—In a lecture "Bakteriologie und Patentrecht" by Dr. Fritz Warschauer, Berlin, Patent Agent, delivered at the recent meeting of German scientists and physicians at Innsbruck, bacteriology has been, for the first time, discussed minutely from the point of view of the German patent right. The lecturer showed numerous instances where the German Reichs-Patentamt has, in acknowledging a justified claim, granted patents for bacteriological process. According to former decisions an invention was considered to be patentable in Germany only if it related to mechanical or chemical treatment or working up of raw materials, *viz.*, if by technical means a technical effect was obtained. In practice, the Reichs-Patentamt has, however, given up this antiquated notion, probably in consideration of the development of bacteriologic science, and by a recent decision it has expressly acknowledged that processes and methods which utilize the vital proceedings of nature are patentable. A list compiled by the lecturer showed that many famous scientists and leading chemical factories are inventors and proprietors of the bacteriological patents.—*Personal Communication.*

A Modification of Albert's Stain for the Diphtheria Bacillus.—The formulas for the modified stain are:

SOLUTION 1

Toluidin blue	0.15	gm.
Malachite green	0.20	gm.
Glacial acetic acid	1	c.c.
Ninety-five per cent alcohol	2	c.c.
Distilled water	100	c.c.

The solution should stand twenty-four hours, and is then ready for use after filtering.

SOLUTION 2

Iodin	2 gm
Potassium iodid	3 gm
Distilled water	300 c.c

STAINING TECHNIC

1. Smears are made and fixed by heat in the usual manner.
2. Solution 1 is applied for from three to five minutes.
3. The slide is washed with water.
4. Solution 2 is applied for one minute.
5. The slide is washed with water.
6. It is blotted dry with filter paper.

R. L. Laybourn, *Jour. A. M. A.*, 83:121 (July 12), 1924.

NOTE: Each month we desire to publish in the Laboratory Notes two or three short articles (not exceeding 250 words) dealing with some phase of applied bacteriology, labor saving devices, modified methods, etc. Contributions should be in the hands of associate editor before the fifteenth of each month.—C. C. YOUNG.

VITAL STATISTICS

LOUIS I. DUBLIN, PH.D.

Health Record for August 1924.—The death rate among the industrial populations of the United States and Canada during August, 1924, was the best ever recorded in any year for that month. The rate was 7.3 per 1,000, and shows a decline of 13 per cent, as compared with the figure for the same month of 1923, 8.4. The figure for July, 1924, was also 8.4 per 1,000. The general death rate for the large cities of the United States in August was 10.5 per 1,000 which may be compared with 10.6 for August, 1923, and with 10.9 for July, 1924. There was an increase in the number of reported cases of smallpox, whooping cough and poliomyelitis as compared with August, 1923, but there was less diphtheria, influenza, measles, malaria, scarlet fever and typhoid. Comparison with the reports for July, 1924, show more malaria, poliomyelitis and typhoid, but less diphtheria, influenza, measles, scarlet fever, smallpox and whooping cough.—*Statistical Bulletin*, Met. Life Ins. Co., Sept., 1924.

Smallpox in American and Canadian Cities.—The number of cases of smallpox for 678 cities of the United States and Canada was 18,811 for the first six months of 1924, as compared with 7,170 in the same cities for the first six months of 1923 and 7,355 for 1922. The number of deaths per 100 cases was 1.3 in 1924, 0.8 in 1923 and 3.1 in 1922. Smallpox was especially virulent in Canada where the fatality rate for 78 cities was 30 in 1924, as compared with 0.3 in 1923 and 9 in 1922. Detroit, Windsor, Pittsburgh and New Britain showed the highest fatality rates.—*Statistical Bulletin*, Met. Life. Ins. Co., Sept., 1924.

Homicide Mortality.—Among white policyholders of the Metropolitan Life Insurance Company, Industrial Department, in 1923 the homicide death rate was 3.5 per 100,000, while the death rate of the colored policyholders was 35.8. In certain states, however (Missouri, Nebraska, West Virginia, Kentucky and Oklahoma), the homicide rates for colored persons were above 50 per 100,000. In Rhode Island the colored rate was 8.1, in New Jersey 8.8, in Virginia 10.3 and in Maryland 12.6. Among white policyholders high rates were recorded during 1923 in Colorado (19.2), Georgia (11.8), Missouri (11.4), Arkansas (11.2), and Tennessee (11.1). The Canadian experience was very favorable (4 deaths per 100,000).—*Statistical Bulletin*, Met. Life Ins. Co., Sept., 1924.

Outlook for the Control of Public Accidents.—There occurred about 84,000 deaths from fatal accidents in the United States during 1923, about 7,500 more than occurred in 1922. In England and Wales, the fatal accident rate was 321 per 1,000,000 population and in the United States 698 per 1,000,000. Because of our higher accident death rate we lose from 35,000 to 40,000 of our citizens annually in excess of the number of deaths which would occur if the British rates prevailed here. Automobile accidents and injuries head the list of fatalities in the United States, accounting for 18.8 per cent of the total accidents in 1923 as compared with 2.6 per cent in 1911. This does not include fatalities arising from collisions in which railway trains are involved.—*Statistical Bulletin*, Met. Life Ins. Co., Sept., 1924.

Mortality of the Chinese in the United States, Hawaii and the Philippines.—The crude death rate of the Chinese in the United States is very high, being 27.1 per 1,000 for the states of California, Oregon and Washington in 1919–1920, as against 12.4 for the total population of these states. This excessive mortality is in large part due to the abnormal age distribution of the Chinese in the United States. Standardization, on the basis of the standard million of England and Wales in 1901, reduces the Chinese rate to 20.0 and the total rate for the entire population of the three states to 11.4. In the city of Manila the crude mortality for the Chinese is much lower than in the United States, and in Hawaii it is lower still. The comparative figures for 1920 are: Registration states, 24.3; Manila, 18.4; Hawaii, 16.9. In both Manila and Hawaii the number of Chinese is intermediate between Caucasians and the native races. Standardization reduces the Chinese death rate in Hawaii for 1919–1920 from 15.8 to 15.3, while it increases the rate for Caucasians from 12.5 to 13.2, leaving a relatively small difference between the two race stocks.

Analysis of deaths by cause indicates that the Chinese in all three regions studied exhibit a consistent and apparently characteristic excessive mortality from tuberculosis, from circulatory diseases and from genito-urinary diseases, as compared with Caucasians. It would appear that so far as these diseases are concerned inherent physical characteristics or racial habits must exert a specific predisposing influence. The excessive mortality from acute respiratory diseases and from external diseases which appear among the Chinese in the coast states are, on the other hand, apparently due to local climatic or social and environmental conditions or to the particular type of Chinese represented in the United States, since death rates from these causes are not excessive in Hawaii or in Manila.—C.-E. A. Winslow and Z. W. Koh, *Am. J. Hygiene*, 4:330–355 (July) 1924.

Infectious Diseases. Germany.—Whereas in the first half of 1923 there was a marked decrease in the incidence of notifiable diseases in Germany as compared with the first half of 1922, in the second half of 1923 there was such an increase in the reported cases of typhoid and dysentery that the prevalence of these diseases in 1923 (2.14 and 1.37 per 10,000 respectively) was greater than in 1922 (1.79 and 0.82). Quite in accord with the locally limited epidemic character of these two diseases their incidence in 1923 varied greatly in different regions. The only other infection that showed an increase in 1923 over 1922 was rabies. Diphtheria and scarlet fever showed improvement in 1923 over 1922, but the decrease was not so marked as in 1922 compared with 1921. Only diphtheria, however, decreased in mortality. There was a large decrease in the absolute number of cases of puerperal fever. Since the number of births has fallen, the percentage of cases to the number of births has not fallen as much (49.7, 44.4 and 41.9 cases per 10,000 births in the years 1921, 1922 and 1923).—*Jour. A. M. A.*, 83:936 (Sept. 20) 1924.

Vital Statistics in Ecuador.—The population of Ecuador in 1921 was 2,000,000, and the death rate was 24.6. Infant mortality forms 34 per cent of the total deaths in the country as a whole but only 22.6 per cent in the three larger cities. Child mortality forms 60 per cent of the total deaths and deaths after 60, 10 per cent. Whooping cough leads the list in child mortality with 4,776 deaths; measles caused 144 deaths. Pneumonia is the greatest cause of death among adults, tuberculosis coming sixth, smallpox and cancer tenth and eleventh. There were only 7 deaths from diphtheria and croup and 10 from leprosy.—*Jour. A. M. A.*, 83:853 (Sept. 13), 1924.

Maternal and Infant Mortality in Physicians' Families.—A study of 1,974 pregnancies and 1,910 living children in the families of physicians in the United States shows that there were 9 deaths of mothers from causes directly or remotely related to pregnancy and the puerperium. The death rate of mothers from puerperal causes per 10,000 pregnancies in this experience was, therefore, 45.5 or .45 per cent. For 83 large cities of the United States in 1920 the maternal risk rate was 81.4. Only 3 of these cities had a rate less than that of the physicians' wives. The infant mortality for the group under study was 43.5 as compared with 79.6 for 583 cities of over 10,000 population in the United States for 1922. This low rate is the more remarkable in that the births occurred over the period of the past 30 years and more when rates were much higher in cities than in 1922. Since comparable figures for other professional groups have not been obtained, there is no evidence that this apparent superiority of protection in physicians' families is due chiefly to better professional care. It is, however, in all probability true that the facts of preventive medicine, so far as they affect the survival of mothers from pregnancies and the escape of infants from the hazards of early life, are better understood and more commonly and effectively used in physicians' families than among other professional groups in the community.—Haven Emerson, *Am. J. Hygiene*, 4:365–385 (July), 1924.

The Biseasonal Prevalence of Infantile Paralysis.—The seasonal prevalence of infantile paralysis in the United States over a period of 11 years (1912–1922) has been studied. There is a marked regularity in the summer prevalence of the disease, the peak occurring in September in 8 of the 11 years and in August in the 3 remaining years. A definitely secondary increase in its occurrence, usually in March or April, has been established. This increase occurs with fair regularity from year to year, and with a certain degree of uniformity in all parts of the country. This suggests the possibility of two modes of transmission of infantile paralysis; the one operating in the summer and the other in the winter or spring.—W. L. Aycock and P. Eaton, *Am. J. Hygiene*, 4:356–364 (July), 1924.

Intarvin in the Treatment of Diabetes.—Intarvin is an odd carbon fatty acid fat that is edible, is absorbed to the extent of about 90 per cent, is catabolized in the body and does not yield the ketone substances derived from butyric acid. The fat is administered by mouth in the following ways: (1) granulation of the fat and direct consumption with the aid of salt, pepper or vegetables; (2) baking with the fat; (3) frying with the fat after "rendering" it with onions; (4) in the form of an ice-cold emulsion in buttermilk; (5) in the form of a flavored drink; (6) with hot drink, such as coffee, broth, etc. The quantity given varies with the patient. It may be given in conjunction with insulin, but it is especially indicated in the nonsevere diabetic individuals, in whom dietetic regulation rather than insulin is the proper method of treatment.—Max Kahn, *Modern Hospital*, 23:255–256 (Sept.), 1924.

The Use of Tryparsamide in the Treatment of General Paralysis.—Of 52 patients with general paralysis treated in the Neuropsychiatric Department of the Philadelphia General Hospital, 15 are now working. Of 11 deteriorated cases none have improved, of 36 cases having organic psychoses with functional coloring 10 are working, and of 5 with transitory psychoses, all are working. In comparison with the arsphenamins, tryparsamide has made a favorable impression, particularly in the comparative absence of reactions following administration. The arsphenamins either alone or with spinal drainage may give negative serologic results without clinical improvement, whereas, tryparsamide frequently gives good clinical results, although the serologic changes are meager and transitory. Increased resistance or increased immunity of patients treated with tryparsamide is well shown in the improvement in general physical status and increased hematopoiesis. In the treatment of these patients about 1,000 intravenous injections have been made, and the unfavorable results are as follows: Jaundice developing after injections in two cases, dermatitis in one case, serious visual disturbances, and the serious question of neurolapse.—F. G. Ebaugh and R. W. Dickson, *Jour. A. M. A.*, 83:803–807 (Sept. 13), 1924.

Gastric and Duodenal Ulcer.—The duration of the ulcer did not seem to influence the outcome in 266 patients treated medically in the last 10 years. Three developed cancer in the ulcer, but the course was so short in two of them that the cancer was probably malignant from the start. In the 172 cases supervised for more than 2 years, the outcome was excellent in 75 per cent of the patients aged less than 40, but only in 48 per cent above that age. Of the total 15 cases of fatal hemorrhage from the ulcer, all but 3 were over 40. Only one died from perforation of the ulcer; this occurred three years later, nearly five years after the first symptoms. The ulcer perforated later, in 2 cases, with recovery after operative measures.—H. Krohn, *Norsk Mag. f. Laegevidensk.*, Christiania, 85:540–547, July, 1924, ab. *Jour. A. M. A.*, 83:960 (Sept. 20), 1924.

The Incidence of Hereditary Syphilis in a Hospital Community.—The records of 1,200 consecutive white admissions to the Children's Medical Service of the Massachusetts General Hospital have been studied to determine the incidence of hereditary syphilis in these cases, which for the most part were supposedly nonsyphilitic. The records were examined for history, physical findings, Wassermann reactions, and, where they existed, post-mortem findings. A diagnosis of syphilis was warranted by the evidence in 31 cases or 2.54 per cent. A provisional diagnosis of syphilis was warranted by the evidence in 9 other cases or 0.73 per cent, making the total 40 cases or 3.27 per cent. Dividing according to age, the incidence of syphilis in children under 13 months was found to be 5.84 per cent, while the incidence in children over 13 months was found to be 1.71 per cent. The figures obtained in this definitely limited hospital population are in close agreement with the figures which Jeans computed from the literature in 1919, and do not differ materially from those reported from St. Louis, San Francisco and Chicago.—M. Wright, *Boston M. and S. J.*, 191:536–539 (Sept. 18), 1924.

Health and Statistics of Austria, First Six Months of 1924.—Although the state of Austria is good as regards prevalence of disease, the birth rate is low in proportion to the death rate, and the marriage rate remains well under the prewar proportion. The emigration figures still show an increase, not merely relatively to the estimated population but in absolute numbers. It is the young adults who are emigrating. Compared to the rates of Germany for the first half of 1924, the Austrian birth rate is 23.3 per 1,000 to 28.1 in Germany. The mortality from infectious disease is somewhat below the average. Smallpox has appeared in 16 or more centers and 2 deaths resulted. Measles has caused less trouble than in previous years, but whooping cough of a severe type is more prevalent than usual. Enteric fever, though less prevalent was responsible for 119 deaths in Vienna.—*Boston M. and S. J.*, 191:556 (Sept. 18), 1924.

Immunity in Diphtheria.—Investigations on immunity in diphtheria among 800 children in primary schools at Warsaw yielded almost the same results as those obtained by various observers in other European countries. The children appear to acquire immunity earlier, however, than elsewhere, 70 per cent of the children between the ages of 6 and 7 showing a negative Schick reaction. Eighty per cent of the adults belonging to the poorer classes were immune, whereas the proportion in the well-to-do classes was lower, being 59 per cent for adults and 48 for school children. Among the Jewish children immunity was acquired earlier than in children of Polish origin.—R. Baranski and H. Brokman, *Compt. rend. Soc. de biol.*, 90:1470–1471, 1924, ab. *Medical Science*, 10:472 (Sept.), 1924.

SANITARY ENGINEERING

ABEL WOLMAN, C.E.

Activated **Sludge Process Has Come to Stay.**—A visit to England indicates a greater amount of study being placed on activated sludge process than in America. Improvements are bound to be rapid, but the most serious study should be given to sludge disposal. Aeration methods are used at Haworth and Sheffield.—T. Chalkley Hatton, *Eng. News-Rec.*, 93:538 (Oct. 2), 1924. A. W. B.

Water and **Sewerage Construction at State Institutions by Maryland Department of Health.**—A description is given of the design and construction of water supply and sewerage systems at various state institutions in Maryland under the direction of the sanitary engineering bureau. The total of work completed to 1924 is $227,496, exclusive of engineering, which amounted to $24,404, or 9.6 per cent of the total, which was paid for by institutions.—George L. Hall, *Eng. News-Rec.*, 93:490 (Sept. 25), 1924. A. W. B.

Typhoid, **Water Supply, Carriers and the Courts.**—Private water companies and municipal corporations which furnish water for human use are both liable for injury due to lack of reasonable care in providing pure water; typhoid fever contracted in the course of employment, due to the negligence of the employer, is an accident under most workmen's compensation laws; and a typhoid fever carrier may be legally quarantined in the interests of the public health, according to recent court decisions.—James A. Tobey, *Eng. News-Rec.*, 93:495 (Sept. 25), 1924. A. W. B.

Additional **Mountain Water Supply for Flagstaff, Ariz.**—Enlargement of the water supply system involves extension of the existing spring-collecting system located in a mountain valley fifteen miles from the town, replacing two nonpressure vitrified pipe conduits with a larger single line of slip-joint, asphalt-coated steel pipe, and doubling reservoir capacity.—R. L. Baldwin, *Eng. News-Rec.*, 93:496 (Sept. 23), 1924. A. W. B.

Operation **of Slow Sand Water Filters at Hartford, Conn.**—The plant consists of a jet aerator and eight rectangular beds of about one-half acre each. No coagulants of any kind are used with Hartford water; long storage and slow sand filtration producing a satisfactory effluent. There was a color removal of 41.7 per cent for 1922 and 1923.—Caleb Mills Saville, *Eng. News-Rec.*, 93:508 (Sept. 25), 1924. A. W. B.

Chlorine as a Criterion of Impurity in Water.—Typhoid morbidity and mortality rates are high in many country towns in Australia and polluted water supplies are suspected as responsible. In the United States the amount of chlorine present in a water has been shown to bear a close relation to population and to the amount of human pollution, and an attempt was made to use this factor in studying the pollution of Australian waters.

The chlorine content of rain water plotted for points in Australia falls into two groups, the first lying within a quarter of a mile of the seacoast, where the values are found running to 20 or 25 and a few to 40 parts per million, which is not inconsistent with conditions in the United States. The second group, however, apparently bears not even a remote relation to the curve of normal chlorine. The values are widely scattered. Four exceed 60 p.p.m., two being at a distance of 20 miles from the sea; ten exceed 30 p.p.m. of which six are 20 miles from the sea, and one shows a value of 24 p.p.m., 140 miles from the sea.

Dust storms are frequent, and may have some bearing on the salt content, although one sample examined showed no chlorine whatever. Evaporation from the sea produces vapors which contain no salt, and if the chlorine in the rain comes from the sea it must be picked up as a fine spray and carried by the wind into the clouds.

These observations in Australia show certain radical differences from the accepted principles, which make it difficult, if not impossible, to construct and make use of a normal chlorine map.—F. F. Longley, *Commonwealth of Australia Health Journal*, 2:110 (July), 1924. A. W. B.

Passaic Valley Trunk Sewer Completed.—A trunk sewer, under construction for twelve years, is completed at an approximate cost of $20,000,000. Starting at Paterson, N. J., the big flume passes through a half-score of municipalities to the banks of Newark Bay, where filtration basins and the largest of three pumping stations are located. It then passes under the bay at a 250 foot depth, and under the city of Bayonne to New York Bay, under which it passes for a distance of 15,000 feet.—*Am. City*, 31:315 (Oct.), 1924. A. W. B.

Trickling Filter Distributors at British Sewage-Works.—Most English plants use traveling distributors, instead of fixed nozzles, because of more uniform distribution and reduction of odors. Trickling filters at Birmingham, Bradford and Leeds are described.—T. Chalkley Hatton, *Eng. News-Rec.*, 93:624 (Oct. 16), 1924. A. W. B.

Infiltration Galleries at the Des Moines Water Works.—The water supply is obtained by a system of collecting galleries which roughly parallel the Raccoon River at a distance of 150 to 200 feet; 10,144 feet of collecting gallery were in use at the end of 1923. The gallery system has met all requirements of peak demand for many years.—Charles B. Burdick, *Eng. & Cont.*, 62:791 (Oct. 8), 1924. A. W. B.

Typhoid Fever and Improvement of Water Supplies.—Now 8,000,000 persons in New York State are served with purified water as compared to 700,000 in 1906. This has resulted in a reduced typhoid rate; the average rate for the 22 year period from 1885 to 1906 was 23.6, and a gradual and fairly uniform drop has been made since then until in 1923 it was 2.9 per 100,000 population. The part played by pure water supplies in this reduction is shown by the result of the installation of filtration and chlorinating plants in such cities as Niagara Falls, Albany, Binghamton, Cohoes. In each case there was a decided and pronounced drop in the typhoid rate immediately after the installation, and the more grossly polluted the source of water supply the more pronounced the drop. C. A. Holmquist, *Eng. & Cont.*, 62:797 (Oct. 8), 1924. A. W. B.

Features of New Water Filtration Plant at Richmond, Va.—The major features of the new works which were built inside the two old coagulating basins consist of baffled mixing chambers of "around-the-end" type, with 10 minutes retention; four coagulating basins which may be operated singly or in parallel; ten filter units of rapid sand type; retention basin for waste water and clear water reservoir.—Wellington Donaldson, *Am. City*, 93:623 (Oct. 16), 1924. A. W. B.

INDUSTRIAL HYGIENE AND OCCUPATIONAL DISEASES

DRS. E. R. HAYHURST and N. C. DYSART

Problems of the Industrial Surgeon.—Three personal qualifications are essential to the success of the industrial surgeon: He must be a good general surgeon, must be well versed in medical jurisprudence and must have the faculty of understanding human nature. When the friends of a patient's family advise as to the treatment and recommend other doctors, the author believes it good practice to call the family physician in consultation. Indeed, consultation should be had in all doubtful cases. In head injuries, questionable internal injuries, and bone fractures all palliative measures should be employed before using the knife. Fear of the witness stand need not be experienced if the surgeon will stick to the truth as to the facts and not tell things contrary to his belief and judgment. The office of the industrial surgeon must be well equipped. An X-ray outfit and picture developing facilities are necessary, as are facilities for baking and massage. The Tait-McKenzie outfit for occupational therapy and a complete physio-therapy apparatus are of great value. There must be an efficient office force for handling these cases.—A. W. Moore, *Hosp. Management*, 18, No. 3, 88 (Sept.), 1924.

Organization of Labor Bureaus.—A bulletin lately issued by the United States Department of Labor presents in convenient form the existing laws providing for the organization and prescribing the duties of the bureaus, departments, or commissions that are charged with the general administration of labor laws and the compilation of statistical and other matters of interest to labor. Inasmuch as workmen's compensation laws have been considered at length in previous bulletins, reference to the functions of various offices in respect to that subject is excluded from the present bulletin. "An attempt has been made to indicate the personnel and working force of the different bureaus, etc. The results are presented, not as complete nor as satisfactory, but as representing the fruits of special inquiry addressed to each office, and such use of appropriation acts and other sources of information as seemed justifiable." However it frequently occurs that while an organization may be provided for by previous laws, current small legislative appropriations so restrict its activities by lack of funds and personnel that it is not effective for the work originally contemplated. —*Bulletin* No. 343, U. S. Bur. of Labor Statist., Aug., 1923.

Health and Safety Bulletin.—Under the title "Health and Safety," the Medical Department of the Eastman Kodak Company, Rochester, has issued a leaflet which is handed to each new employee:

"The Medical Department is organized for service to the employees on all matters concerning health. Under the Compensation Law injured employees are compelled to report accidents to the Company if they expect the Company to be responsible for the expense incident to injuries. We especially warn each new employee against failure to report even trivial injuries sustained on the Plant. Our experience has taught us that these injuries may be very disabling to the employees and very costly to us. The Medical Department is just as willing and ready to serve employees who are sick on the Plant as it is to serve those who are injured. The advice, coöperation and assistance of the Medical Department has saved a good deal of money and time to employees who are sick. Our Department has very up-to-date adequate means of diagnosing even obscure cases. We are trying to administer this service in a kindly and sympathetic manner to each employee who may need it. We only ask that you avail yourself of the opportunities which this Department offers.

"We have learned through costly experience that a great deal of sickness is preventable and that almost all accidents are preventable. Neglect of our health is often quickly followed by sickness. Neglect of existing rules and regulations is often followed by an injury. It is our desire to have as little sickness as we can and to arrive at the time when there will not be a single accident in our works. . . . Our aim is that each employee shall have good health and safety."

Child Labor.—An interesting booklet of outlines for study of child labor has recently been issued by the Children's Bureau, United States Department of Labor. It presents in simplified form outstanding features of the child labor problem. The outlines furnish an approach to the subject, indicate a method of study, and put into easily readable form material from many widely scattered sources. While the medieval apprenticeship system imposed regulations which were in many respects beneficial to the child where adequately enforced, conditions under the modern factory system have become progressively hard. Exploitation of children as a result of the growth of this system, has perhaps been less in the United States than in England. In America the first legislative remedies for this situation were sought when the lack of education among working children was appreciated. The next step was the regulation of hours of work. Only recently have certain minimum conditions of health and physical development been required of child workers, and this has resulted in some restrictions on the numbers of children entering employment. The 1920 Census reports that 1,060,858 children 10 to 15 years old, inclusive, were employed at some wage-earning occupation. Of these, 61 per cent were engaged in agricultural pursuits, and therefore were not subject to direct legal regulation. An instructive section on the present legal status of child labor in the United States is included, as is also a sketch of the attempts at Federal legislation.—*Child Labor*, Children's Bureau Publication No. 93, U. S. Dept. of Labor, 1924.

FOOD AND DRUGS

C. L. ALSBERG, M.D., AND D. B. DILL

Iodine Content of Sea Foods.—Sea foods were found to contain a higher percentage of iodine than any other common foods. In order of decreasing iodine content the more common foodstuffs are divided into the following groups: (1) Marine algae; (2) oysters, clams and lobsters; (3) shrimp; (4) crabs and most ocean fishes; (5) freshwater fishes, vegetables, beefsteak, milk, etc. Oysters, clams, lobsters contain about two hundred times as much iodine as milk, eggs, or beefsteak; shrimp one hundred times as much; and crabs and most ocean fishes fifty times as much. An extensive bibliography is appended. —Donald K. Tressler and Arthur W. Wells, *Bureau of Fisheries Document* No. 967, Dept. of Commerce (1924).

Studies of the Vitamin Potency of Cod-liver Oil. VII. The Vitamin a Potency of Hake-Liver Oil.—The inclusion of hake livers with cod livers which are to be used for the manufacture of medicinal cod-liver oil does not decrease the vitamin A potency of the resulting oil.—Arthur D. Holmes, *Ind. Eng. Chem.*, 16: 379 (1924).

Journal of Oil and Fat Industries.—The American Oil Chemists Society has issued a new journal, the first number of which appeared in July. The Editorial Board consists of Herbert S. Bailey as Editor, Fred H. Smith as Managing Editor, and the following Associate Editors: David Wesson, Geo. S. Jamieson, A. W. Putland, A. D. Holmes, Glenn H. Pickard, and Milton Jarnagin. The *Journal* will contain the proceedings of the society, the reports of the various committees of the society for the standardization of the methods of analysis of fats, oils, and waxes, and original communications. The *Journal* fills a decided need, is well made, and should prove essential to all those who are interested in the chemistry of fats and oils.

Unique Dietary Needs for Lactation.—Experiments with rats demonstrated that the function of lactation demands for its normal expression either one or more dietary elements different from those adequate for normal growth and for normal reproduction or else larger quantities of certain dietary elements. Young from pure food mothers when suckled by normal mothers possess the same capacity to grow during lactation as do normal animals suckled by their own mothers. The natural foods therefore contain a substance or substances essential for the normal function of the mammary gland. Food requirements for normal lactation in the rat are not fulfilled by the classical synthetic dietaries of fat, carbohydrate, and protein together with salts and an abundance of the known vitamins A, B, C, D and X—dietaries entirely adequate for growth and reproduction.—H. M. Evans, *Science*, 60, 20:2 (1924); *Chem. Absts.*, 18: 2742.

Recent Advances in Protein Chemistry.—The newer methods for isolation and determination of the amino acids of proteins are described briefly. Following the most improved methods, Dakin has been able to increase the summation of amino acids in gelatin to 91.3 per cent and in zein to 101.5 per cent. It is improbable that any appreciable amount of a hitherto unknown amino acid can occur in zein. It is predicted that the day is not far distant when we shall know the composition of the whole of the molecule of at least one protein. The present view regarding the physical chemistry of the proteins is summarized. ". . . we have learned to look upon proteins not as mysterious colloidal complexes, but as chemical individuals of, in certain cases, quite well-known composition, with properties which conform to the laws of classical chemistry."—H. B. Vickery, *Ind. Eng. Chem.*, 16: 1029-30 (1924).

Recent Progress in the Chemistry of Pectin.—The chemistry of pectin and the industrial manufacture of pectin are considered briefly. It has been calculated that Germany could obtain 176,000 tons of pectin annually from sugar beets. While of questionable food value, it is considered as a possible source of galactose and of mucic acid.—W. H. Dore, *Ind. Eng. Chem.*, 16: 1042-4 (1924).

The Biological **Standardization of Insulin. II.**—The Mortality and Glucose-protective Test in Rats as a Method for the Bio-assay of Insulin.—The toxicity of insulin in rats shows marked differences according to method of administration of the drug. The toxicity is greatest with subcutaneous injections, lower with intravenous and lowest with intraperitoneal injection. The standard deviation in the blood sugar of rats is much smaller than in the case of rabbits. Insulin given to rats in sufficient amount to cause severe symptoms lowers the liver and muscle glycogen about one-half. On account of the variability in individual susceptibility it is recommended to use not less than ten animals on each dose for purposes of bio-assay. Applying a standardized method, which is described in detail, there was found considerable variation in potency of commercial insulin preparations. A bibliography is appended.—Carl Voegtlin, Edith R. Dunn and J. W. Thompson, *Public Health Reports*, 39: 1935-57 (Aug. 8), 1924.

Antiscorbutic **Potency of Whole-Milk Powder.**—The milk used in the experiments was obtained from 1,276 cows. It was mixed, sampled, chilled and portions were shipped daily in sterilized steel vacuum bottles. The balance of the milk was condensed in a continuous steel evaporator and pasteurized in a closed glass-lined tank at 145° F. for 30 minutes in the absence of air. The hot pasteurized evaporated milk was atomized under exceedingly high pressure in a drying chamber where the milk dried instantaneously, the powder being removed at intervals of two to two and one-half hours. Samples of this powder were shipped daily, with corresponding samples of fluid milk. Several groups of guinea pigs, 10 to a group, were fed on a basal ration plus the experimental milks. The control groups developed scurvy in about 14 days, but were cured of the disease by the addition of fresh powdered orange and lemon juices, the latter having been manufactured by the same process as the powdered milk. Other groups which received the basal ration plus the fresh and powered fruit juices from the beginning of the feeding period grew well and did not develop scurvy. A comparison of growth curves, time of appearance of scurvy symptoms, and post-mortem appearance of guinea pigs showed remarkable similarity when raw and powdered milks were fed at the same level. No marked differences could be noted in the appearance and deportment of animals when the raw and powdered milks were fed in equivalent amounts.—G. W. Cavanaugh, R. A. Dutcher and J. S. Hall, *Ind. Eng. Chem.*, 16: 1070-3 (1924).

Pellagra in Relation to Milk Supply in the Household.—It is pointed out that in many sections of the South economic and dietetic conditions are ordinarily barely sufficient to maintain adequate nutrition. Three instances, which are considered typical, are reported in which the influence of the variation of only one item of food (milk) on the incidence of pellagra was established. A prolonged interruption in the quantity of fresh meats consumed, in the absence of an adequate supply of milk or other protective foods, frequently precedes the appearance of pellagra. Conversely, in pellagrous families, the establishment of an adequate supply of some protective food is frequently observed to precede the disappearance of pellagra.—G. A. Wheeler, *Public Health Reports*, 39: 2197-9 (Aug. 29), 1924.

Fat in the Ration of Diabetics.—Observations with three diabetics led to the following conclusions: Each sick person has need of a certain amount of fat appropriate to his particular condition, but relatively small for the pronounced diabetic. This amount of fat also depends on its chemical constitution and on the relative proportion of proteins and carbohydrates in the ration. The balance sheet of carbohydrates as clinically observed gives only an incomplete idea of the integral metabolism of substances which are the generators of sugar. While allowing with the same regimen a better utilization of carbohydrates, insulin also assures the assimilation of a quantity of fats which would be impossible without its influence. In the pronounced diabetic the equilibrium regimen should be established for each subject after analysis of the blood and urine with reference to the total nitrogen, sugar, beta-hydroxybutyric acid and the ketonic substances. Even with the help of insulin the authors have found it exceptional that the beta-hydroxybutyric acid totally disappears from the urine in grave cases.—A. Desgrez, H. Bierry and F. Rathery, *Compt. rend.*, 178, 1771-5 (1924); *Chem. Absts.*, 18: 2741.

CHILD HYGIENE

TALIAFERRO CLARK, M.D.

Antenatal Clinics and Their Application to Private Practice.—The results of a year's practice in the antenatal department of the City of London Maternity Hospital is taken as a basis in the consideration of how far they might be applied to private practice. There are two definite phases or periods in antenatal work: (1) From conception to viability of the foetus, concerned with preservation of pregnancy and the health of the mother, and (2) from viability onward, when the aim is that of obviating untoward developments during labor. Emphasis is placed on the value of seeing patients early in the first phase with a view of educating and explaining the value of antenatal methods; on the importance of obtaining medical history, routine examination of heart, lungs and urine, and instruction in personal hygiene—such as modification in diet, the ingestion of plenty of fluid, and the care of the breasts; and on warning to patients to report anything abnormal. With regard to the second phase, of 2,145 patients examined, 204 presented some abnormality requiring treatment or investigation, as follows:

1. Albuminuria, in 57, or 27.9 per cent of the cases requiring treatment.
2. Pyelitis of pregnancy in 0.4 per cent as determined by bacteriological examination.
3. Abnormal presentation; one shoulder and two faces; not recognized by antenatal examination.
4. Breech presentation; probably occurring more commonly than was usually thought to be the case, usually easily diagnosed.
5. Misfits; recognized by unduly high situation of the foetal head and present in 24 cases.
6. Occipito-posterior position.—*The Lancet* (Aug. 23), 1924.

Pulmonary Tuberculosis in Childhood.—Statistics based upon the result of autopsies carried out at the various children's hospitals in London show that, after the first six months of life, nearly 30 per cent of all the deaths of infants under five years are due to tuberculosis, and in about two-thirds of these the disease has its origin in the chest (J. Walter Carr). The indefiniteness of the clinical signs is emphasized by several authorities, some of whom lay stress upon the diagnostic value of the von Pirquet test, and others are equally enthusiastic with regard to the importance of a positive D'Espine's sign.

Priestman puts forward a suggestion that many of the fatal cases of so-called "pneumonias" in children may after all be "acute tuberculosis." In his wide experience of school medical inspection, he is led to believe that hilus tuberculosis is common in childhood, and that the glandular invasion spreads downward and outwards into the bronchioles, producing a clinically recognizable moist condition which should always be regarded with suspicion, especially when unilateral. Indeed, it is possible that many of the cases of chronic bronchitis in early life may be a benign form of tuberculosis in which a comparatively mild bacillary infection has induced a considerable amount of pulmonary fibrosis. In proof of this assumption may be adduced the fact that these cases of catarrhal "bronchitis" generally do well when placed upon an anti-tuberculosis regime, including open air treatment. Those who have been urging the wholesale adoption of open-air schools will readily agree that these institutions are both preventive and curative of the disease at this susceptible period of life.—*Med. Off.* (Aug. 23), 1924.

School Closure for Infectious Diseases.—The board of education has issued a circular to local authorities proposing to amend the elementary educational provisional code, 1922. The main point of alteration evidently deals with the question of school closure. The board of education has now come to the conclusion that the best means of preventing the spread of infection during an epidemic is not the closure of whole schools or departments, but the careful consideration of individual children. Such closure is, in the opinion of the board, rarely justified on the grounds of health, while on educational grounds it is obviously desirable that schools should remain open.—Editorial, *Lancet*, September 6, 1924.

Successful **Breast Feeding.**—There are many cases where, for one reason or another, the infant does not thrive at the breast, or is brought to be weighed because its mother fears it is not thriving. Some of these cases offer considerable difficulty of diagnosis, and even the most careful instructions based on examination of the mother and child sometimes fail to effect improvement. Weekly inspection and weighing will show that the baby is not thriving, but they do not discover the cause in obscure cases. According to one mother, the baby is not satisfied and cries after nursing. It is found after careful observation that the feeding had gradually become entirely one-sided and involution had set in. After a few days' systematic training the yield of milk steadily improved in the disused gland, and increased also in the previously over-worked and partially exhausted breast. Another woman complains that her child is not satisfied with the breast-milk; cries all day; and is vomiting profusely. She thinks the milk is failing. On weighing the child before and after a series of meals, it was found that the "dissatisfaction" and vomiting was due to the pain of overfeeding. The milk supply was over-abundant, with an average yield of 6 and 7 ozs. per feed. Inspection of the breasts frequently gives no information which could lead one to expect a surplus of milk. Satisfactory feeding may be had by curtailing the feeds.—Maternity and Child Welfare Problems, Harold Waller, *Med. Off.*, August 30, 1924.

Diet and **Growth.**—In a previous paper the postulate was made that nutritive conditions which are ideal for tissue regeneration likewise suffice for growth, and the experimental results bore out the theory. In the present investigation, the influence of inadequate diets on the rate of tissue regeneration may be summarized as follows:

The relative toxicity of chloroform given subcutaneously to rats fed on two diets deficient in respect to their nitrogeneous components, the sole sources of protein in which were, respectively, gliadin and gelatin, and to rats without food, is greatest on gelatin diet, fasting, and gliadin diet in the order named.

The rate of regeneration of liver cells after chloroform poisoning in rats fed a diet in which gliadin is the only protein is about as rapid as that in animals fed a diet containing casein as the source of nitrogen. The rates of regeneration on a food containing its nitrogen as gelatin and also during fasting is definitely slower than that in animals fed the gliadin food.

The results of these experiments indicate that the requirements for the essential amino acids for growth of individual organs of the body is less than that for correlated growth of the whole body.—Arthur H. Smith and Theodore S. Moise, *J. Exper. Med.*, (Aug. 11), 1924.

Diphtheria in an Immunized Group.—Since November, 1921, every child admitted to the Denver Orphans Home has received three injections of toxin-antitoxin. No Schick tests were done before admission or to determine the results of attempted immunization until the recent outbreak of diphtheria. At the onset of the present epidemic the personnel of the institution comprised 135 children, aged 6 months to 14 years, and 23 adults. The first clinical case of diphtheria appeared on January 24, 1924, and by March 14, 1924, 11 cases had developed. The following observations are based on the study of these cases:

1. The routine administration of toxin-antitoxin insures a low morbidity and mortality.

2. It is not a safe or economical procedure to omit the Schick test after the administration of toxin-antitoxin. Fifteen cases or 16.8 per cent of those immunized six months or more before the epidemic were Schick positive.

3. The possibility of Schick-negative individuals developing diphtheria must always be kept in mind.

4. Of the eleven cases recorded, six were Schick negative, but only three of these were typical of pharyngeal diphtheria and one received no antitoxin.

5. Five children presented both positive Schick test and positive throat cultures, but developed no diphtheria.

6. All of the typical clinical cases still had their tonsils, and 43.67 per cent of the contacts showing positive cultures had not had their tonsils removed.

7. There is no evidence that immunization increased the liability to the carrier state.

8. The tonsil and adenoid operation and small group isolation proved the most effective means of halting the epidemic.—An Epidemic of Diphtheria in an Immunized Group of Children, R. P. Forbes and Berryman Green, *Arch. Pediat.*, September, 1924.

Relation of Obstetrics to Preventive Medicine.—"Much of the brilliant obstetrical surgery is no more than a belated recovery from a position that could have been avoided. Preventive obstetrics begins with pregnancy and is not finished with convalescence. If it were required that the student should observe and care for a case of pregnancy, beginning at the second month and following her through labor and the puerperium, a better training in and understanding of obstetric problems would result.

With the reorganization of the Social Service Department at the Sloane Hospital for Women, in 1920, there gradually developed an increased responsibility of the patient to the hospital, with the natural corollary of increased responsibility of the hospital to the individual patient, so that the prenatal clinic is no longer left to the supervision of the intern staff. The attending staff must be in attendance for consultation and advice. Careful histories of previous illnesses and labors must be recorded at the initial visit, and coördinated with the report of the Social Service Department of the home conditions and environment of the patient.

A complete physical and pelvic examination is made; pelvic measurements are recorded; Wassermann is taken; blood pressure is taken; and urinary examination is made. On the suspicion of physical defect or history of chronic disease such as tuberculosis, cardiovascular disturbance, etc., consultations are immediately held with the attending physician, and his findings are recorded. The importance of focal infection, and especially such infections as arise from dental caries has led to routine dental survey in all cases including X-ray examination, and dental treatment instituted when needed.

As a result of this examination in the prenatal clinic during the years 1922 and 1923, it was found that about 17 per cent of the cases registered needed treatment and supervision either in the hospital or special clinics.

Of 3,460 deliveries during the past two years, 238 cases of pregnancy were associated with toxemia; 223 had a positive Wassermann; 44 had marked cardiac disease; 32 had pulmonary tuberculosis; 80 pyelitis; 90 pelvic or abnormal condition requiring Caesarean section; and 59 cases had fibroids of the uterus, large enough to interfere with the possible course of pregnancy or labor. Good results have been obtained from the active treatment of positive Wassermann cases irrespective of the time in pregnancy at which it was instituted.

It is becoming more and more evident that the termination of pregnancy in the presence of symptoms of toxemia (without first attempting to relieve the symptoms by hospital care and appropriate treatment) often defeats the object desired and proves fatal to both mother and child.

Of 89 expectant mothers registered in a special clinic established for cardiac cases, 75 were delivered with only two maternal deaths. Such cases, under proper treatment and rest at the first sign of cardiac embarrassment, may often be carried through their pregnancy and by judicious handling at the time of labor may be carried to a successful termination.—William E. Studdiford, *Boston M. & S. J.*, October 2, 1924.

Mental Defect in a Rural Area.—During a period of two and one-half years, beginning in January, 1921, a total of 4,979 children came under review in a rural area. The method of special examination consists of a physical and mental examination, an inquiry into the educational progress, conduct, temperamental conditions, social relations of the child, and the family history. Intelligence tests comprised an important part of the investigations. The Stanford revision of the Binet-Simon tests was used in all cases.

The number of mentally defective children was found to be 3 per cent of the school population. Of this percentage, 0.5 per cent were classified as imbeciles and 2.5 per cent as feebleminded. It is believed that the actual percentage found fell short of the real number present, and that this number was probably somewhere in the neighborhood of 4 per cent, or even higher.

Based on a consideration of typical families, it was observed that the mentally defective children were in most cases the offspring of generally degenerate stocks, the members of which were incapable of performing in any adequate way the duties and responsibilities of citizenship, but who were not incapable of earning a living of some sort in a rural environment.—Mental Defect and Mental Degeneracy in a Rural Area, G. K. Bowes, *The Lancet*, August 16, 1924.

HEALTH EDUCATION AND PUBLICITY

EVART G. ROUTZAHN

Advertising Venereal Disease Pamphlets.—From New Jersey *Public Health News*, July-August, 1924, comes this interesting account:

The Bureau of Venereal Disease Control undertook an interesting experiment in advertising. During the month of May the following "reader" advertisement was inserted in one hundred and nineteen papers throughout the state:

KEEPING FIT IN NEW JERSEY

Every month several thousand New Jersey citizens write to the State Department of Health at Trenton for some of its pamphlets on social hygiene.

These interesting publications give the real facts about subjects that so many people badly misunderstand.

Everyone likes to read whatever Will Irwin writes. In "Conquering an Old Enemy" he tells about venereal disease control.

"Manpower" is a frank and honest pamphlet on sex life for young men.

"On Guard" tells the young woman how to protect herself and how to help others.

Boys of high school age, in school or out, find "Keeping Fit" interesting and valuable.

For girls of the same age "Healthy Happy Womanhood" is offered.

Information of vital importance for those about to marry in "The Right to Marry."

Drop a line to the Director of Health, State House, Trenton, New Jersey, and he will send you any of these pamphlets free. Do not enclose return postage. State how many you can use if you wish to hand some to friends.

Among these newspapers were some of the more important city daily publications and practically all of the weekly country papers. As a result of the advertisement 632 individual requests were received calling for a distribution of 6,568 pamphlets. An analysis of the requests received showed that 156, or approximately one-quarter, were signed by unmarried women; 219, or over one-third, were signed by married women, 237, or more than one-third, from men (the marital status, of course, could not be determined); and 20 requests from group leaders. It is of interest to note that less than one-tenth of the letters received appeared to have been written by children, so far as it could be judged from the handwriting.

Only one newspaper in the state refused to accept the advertising, and this paper refused on the ground that such an advertisement would induce children to write for pamphlets because of a morbid curiosity in the subject. If some of the requests did come from children there was nothing in the pamphlets they received to do them any harm.

In dollars and cents the cost per request received was high, but on the other hand the pamphlets went only into the hands of people who wanted them enough to write for them, which means that the pamphlets probably were read when they were received. Many of the letters came from persons who could be interested in arranging for public lectures on social hygiene, and these letters are being followed up.

An Attractive Report on the 1924 May Day.—The report of the Child Health May Day celebration illustrates an effective variation for special reports. The report is multigraphed on letter size sheets, with stiff covers, tied with cord. The cover is a sunny shade of yellow with a border of orange colored silhouettes of happy children across the top. The cut page indexing is uncommon, and should be effective in getting attention for the contents. Few copies of the limited edition are available through the American Child Health Association, 370 Seventh Avenue, New York City. The editor of this department will *loan* a copy.

Cardboard Food Exhibits. — A clever graphic aid for dietetic work in the home, the school, the health center or public exhibits has been devised by Lydia J. Roberts of the University of Chicago. "Food Models" consist of eleven pages of outline drawings of food portions, life-size. The drawings are to be cut out, colored if desired, and used when it is impracticable to have real foods. The

author suggests some interesting uses in children's groups in connection with clinics and hospitals. The interested parent can turn them into a game for the children. Nurses and other home visitors may find them useful.—University of Chicago Bookstore, 5802 Ellis Avenue, Chicago, Ill. $.75.

"Coming: A Day When Everybody's Well!"—This is the heading of an editorial in *Collier's Weekly*, Aug. 2, 1924, from which we quote: "In the most enlightened American towns to-day, you do not hear people pitying and sympathizing with the sick. They are beginning to be critical of anyone who abuses or neglects his body. They are scornful of a parent who cheats a child by letting it fall ill. After all, time is more important to a child than to a grown-up. He has so many things to do with it, so much to learn, so much to play with, so many dreams and so many realities to pursue and grasp.

"He ought not to have to waste a day of his precious childhood in being laid up by ills that we can keep away from him.

"The scorn of our neighbors is the jail to which we shall all some day be sentenced for breaking the laws of health. And our own troubled conscience will be the stern jailer."

PUBLIC HEALTH LEGISLATION

JAMES A. TOBEY, LL.B.

Congress Reconvenes.—The second session of the Sixty-Eighth Congress convenes by law on the first Monday in December and will adjourn automatically on March 4th. The Sixty-Ninth Congress, unless called in special session, will not meet until the following December. All legislative matters not acted upon during the first session of the Sixty-Eighth Congress continue their status in the second session. Included are a number of measures relating to public health, but it is unlikely that much attention will be given to them. Due consideration will, in fact, probably never be given to national vitality by that branch of our government until public health has a definite lobby in Washington, just as have commercial interests, labor, farmers, veterans, and various other essential component parts of our nation. Whatever action, if any, on health matters is taken by this Congress will be reported in these columns.

Personal Liability of Health Officers.—An article on the subject of the personal liability of health officers was said by a city health officer at the recent Detroit meeting of the A.P.H.A. to have saved him from a disastrous lawsuit. This material appears in the *American City* for October, 1924, on page 364, and gives useful citations to many court decisions on this important topic.

A health officer cannot, as a rule, be held individually liable for injury or damage arising out of any act which is authorized by the board of health, or which is essential to the public health, provided that in performing his duties he acts in a reasonable and prudent manner. He is not liable for a mistake in judgment or an error in performing acts within the scope of his authority, in the absence of malice or corruption or a definite statute imposing such liability. A mistake in quarantine, for instance, will not create personal liability, provided due care was taken by the health officer.

Some of the incidents in which courts have held that there was no liability have included: ordering removal of wallpaper of room after occupation by a smallpox patient; failure to remove a diseased person from a house; quarantine of a vessel; fumigation of a millinery shop; failure to provide a nurse as required by law; and exclusion of an unvaccinated child from school.

Where the action of the health officer is arbitrary and oppressive, or he is negligent, or acting beyond the scope of his authority, he may be personally liable. Such instances adjudicated by the courts include: quarantine in a tent in cold, damp weather so as to cause death of the patients; forcible examination for venereal disease in the absence of reasonable suspicion of its existence; arbitrary fumigation of a vessel possessing a clean bill of health; unauthorized use of dwelling as a hospital; unwarranted flooding of land; neglect in preventing sale of impure milk; destruction of property which was actually not

dangerous to health. It is well to remember the advice given by a court in New York (People ex rel. Copcutt v. Board of Health, 140 N. Y. 1, 35 N. E. 320, 23 L. R. A. 481, 37 Am. R. 522), "whoever abates a nuisance, unless acting under court order, does so at his peril and must prove the nuisance." This is a reasonable safeguard and, like all law, is based on the theory of doing justice to all concerned.

Questions and **Answers.**—In response to our call for suggestions in the October number of the JOURNAL, we have had several inquiries and comments on legal aspects of public health, and also quite a few requests for reprints. Two of the questions asked, with the answers thereto, which will be of general interest, are given herewith:

POLLUTION OF PUBLIC WATER SUPPLIES

Q. "We are interested in the legal aspects of compelling gas plants and by-product coke plants from discharging phenolic wastes into public water supplies which are subsequently chlorinated." (Michigan.)

A. The right of the general public, and especially of riparian owners, to have a stream come to them in its natural state of purity is a fundamental principle of the common law. This right has also been expressed in written statutes and there is in Michigan, we believe, a law prohibiting the pollution of streams. If, therefore, pollution of the water is actually taking place, and as the introduction of manufacturing wastes into streams has often been held by courts to constitute such pollution (see Dumont v. Kellogg, 29 Mich. 420), proper legal action may be taken and, if the cause is proved, should result in remedying the conditions. Since the matter affects the public, the procedure would be to report to the State Health Department. If, after suitable notice and hearing by the department and the issuance of orders to abate this nuisance, it is still maintained, the State Attorney General should then institute court action. This would be an action for injunction. Michigan already has an important precedent for such procedure in the case of Attorney General v. City of Grand Rapids, 175 Mich. 503, 141 N. W. 890.

The United States Public Health Service has a very useful bulletin (P. H. B. No. 87) on this subject of stream pollution, which was issued in 1917 and if still in print is worth having. Incidentally, two recent court decisions on this subject of stream pollution have held: (1) that a city which creates a nuisance by discharging sewage into a stream, even though from a sewage disposal plant, is liable in damages for such nuisance (Mitchell Realty Co. v. City of West Allis, Wis., 199 N. W. 390); and (2) that a permit from the State Board of Health to a city authorizing it to discharge sewage effluent in a stream does not also permit it to create or continue a nuisance (People v. City of Reedley, Calif., 226 Pac. 408).

LIABILITY FOR SUMMER CAMPS

Q. What is the liability of a municipality for maintaining a tuberculosis summer camp? of a voluntary association?

A. A municipality is never liable for acts done in a governmental capacity, though it is for those performed in a corporate or business capacity. In the former category are practically all matters pertaining to the protection of public health. The maintenance of a summer camp for the tuberculous would be a proper function of public health protection. There would be no liability, in the absence of a statute to the contrary.

A. A charitable corporation or association is not liable for injury due to acts taken in the course of its philanthropic ventures, which are not undertaken for profit. A voluntary association maintaining a camp for the tuberculous would, as a general rule, not be liable.

Miscellaneous.—Next month an index of some of the more important items discussed in these columns during the past year will be given.

The Child Welfare Summary of the U. S. Children's Bureau, Washington, D. C., for September 27, 1924, gives a general survey of 1924 child welfare legislation.

A Pan-American Maritime Sanitary Code has been drafted by the Pan-American Sanitary Bureau and was offered for study and adoption at the Seventh Pan-American Sanitary Conference in Havana, Cuba, in November.

The Quarterly Bulletin of the Louisiana State Board of Health for September, 1924, gives texts of new health laws in that state.

CONVENTIONS, CONFERENCES AND MEETINGS

This calendar is published through the coöperation of the National Health Council, 370 Seventh Avenue, New York City. The Council will be glad to answer promptly any written or telegraphic inquiries regarding meeting dates in order to avoid conflicts.

December 1-4, American Society of Mechanical Engineers, New York, N. Y.

December 4, National Dairy Council, Chicago, Ill.

December 4-6, Western Surgical Association, French Lick Springs, Ind.

December 5-6, Fiftieth Annual Session, New Jersey State Sanitary Association, Atlantic City, N. J.

December 5-7, National Housing Association, Philadelphia, Pa.

December 8-12, Radiological Society of North America, Kansas City, Mo.

December 9-11, Southern Surgical Association, Charleston, S. C.

December 11-13, National Society for Vocational Education, Indianapolis, Ind.

December 29-31, Society of American Bacteriologists, Washington, D. C.

December 29-31, American Physiological Society, Washington, D. C.

December 29-31, American Society of Biological Chemists, Washington, D. C.

December 29-31, American Association for Labor Legislation, Chicago, Ill.

December 29-January 3, American Association for the Advancement of Science, Washington, D. C.

January 21-23, American Society of Civil Engineers, New York, N. Y.

January 29, Massachusetts Association Boards of Health, Boston, Mass.

February 2, American Heart Association, New York, N. Y.

February 22-27, Department of Superintendence of the National Education Association of the United States, Cincinnati, Ohio.

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